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Monthly Energy Review, updated the last week of the month
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Preface

The *Natural Gas Monthly (NGM)* is prepared in the Data Operations Branch of the Reserves and Natural Gas Division, Office of Oil and Gas, Energy Information Administration (EIA), U.S. Department of Energy (DOE).

General questions and comments regarding the *NGM* may be referred to Kendrick E. Brown, Jr. (202) 586-6077, Ann M. Ducca (202) 586-6137, or Eva M. Fleming (202) 586-6113. Specific technical questions may be referred to the appropriate persons listed in Appendix E.

The *NGM* highlights activities, events, and analyses of interest to public and private sector organizations associated with the natural gas industry. Volume and price data are presented each month for natural gas production, distribution, consumption, and interstate pipeline activities. Producer-related activities and underground storage data are also reported. From time to time, the *NGM* features articles designed to assist readers in using and interpreting natural gas information.

The data in this publication are collected on surveys conducted by the EIA to fulfill its responsibilities for gathering and reporting energy data. Some of the data are collected under the authority of the Federal Energy Regulatory Commission (FERC), an independent commission within the DOE, which has jurisdiction primarily in the regulation of electric utilities and the interstate natural gas industry. Geographic coverage is the 50 States and the District of Columbia.

Explanatory Notes supplement the information found in tables of the report. A description of the data collection surveys that support the *NGM* is provided in the Data Sources section. A glossary of the terms used in this report is also provided to assist readers in understanding the data presented in this publication.

All natural gas volumes are reported at a pressure base of 14.73 pounds per square inch absolute (psia) and at 60 degrees Fahrenheit. Cubic feet are converted to cubic meters by applying a factor of 0.02831685.

ERRATA

The Feature Article, "The Intricate Puzzle of Oil and Gas 'Reserves Growth,'" was published in the July 1997 issue of the *Natural Gas Monthly*. On page x in the section entitled "The Importance of Ultimate Recovery Appreciation," the percentages describing the portion of total reserves additions attributable to ultimate recovery appreciation from 1977 through 1995 were incorrectly stated. The correct values are 93 percent for crude oil and 86 percent for natural gas.

Also, end note 21 on page xx was missing two equations. The complete text of the end note is as follows: 21. For example, both of the following equations (where GF equals cumulative appreciation factor, t equals the elapsed post-discovery years, and a, b, and c are regression coefficients), which have not been used, will fit the data just as well as any of the equations that have been used:

$$GF_t = \frac{(a+ct)}{(1+bt)}$$

$$GF_t = a + \frac{a}{t} + \frac{c}{t_2}$$

Common Abbreviations Used in the Natural Gas Monthly

AGA	American Gas Association
Bbl	Barrels
BLS	Bureau of Labor Statistics, U.S. Department of Labor
Bcf	Billion Cubic Feet
BOM	Bureau of Mines, U.S. Department of the Interior
Btu	British Thermal Unit
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
EIA	Energy Information Administration, U.S. Department of Energy
FERC	Federal Energy Regulatory Commission
IOGCC	Interstate Oil and Gas Compact Commission
LNG	Liquefied Natural Gas
Mcf	Thousand Cubic Feet
MMBtu	Million British Thermal Units
MMcf	Million Cubic Feet
MMS	United States Minerals Management Service, U.S. Department of the Interior
NGL	Natural Gas Liquids
OCS	Outer Continental Shelf
STIFS	Short-Term Integrated Forecasting System
STEO	Short Term Energy Outlook
Tcf	Trillion Cubic Feet

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Worldwide Natural Gas Supply and Demand and the Outlook for Global LNG Trade

This article is adapted from testimony by Jay Hakes, Administrator of the Energy Information Administration, before the Senate Energy and Natural Resources Committee on July 23, 1997. The hearing focused on the examination of certain aspects of natural gas into the next century with special emphasis on world natural gas supply and demand to 2015.

Natural gas is a highly desirable energy source. It burns cleanly, with less pollution than other hydrocarbon fuels, and proved reserves of natural gas are immense—some 4,900 trillion cubic feet worldwide at the end of 1995, enough for about 60 years supply at current world gas production rates. However, much of the world's known natural gas reserves are inconveniently located in remote and thinly populated areas, such as Western Siberia and the Persian Gulf. The United States and Canada have been girdled with large gas pipelines that transport gas from the producing fields of Texas, Louisiana, Oklahoma, and Alberta to consuming markets in California, New England, and elsewhere. At present, however, pipeline transport is generally not an economically feasible option for transporting natural gas across oceans. Moving natural gas between continents requires an alternative approach.

Liquefied natural gas (LNG) is a proven commercial technology for transporting natural gas across oceans. The international trade in LNG is more than 30 years old. LNG is presently being exported from eight countries (Indonesia, Algeria, Malaysia, Australia, Brunei, the United Arab Emirates (UAE), the United States, and Libya) and imported into eight countries (United States, Japan, South Korea, Taiwan, Belgium, France, Spain, and Turkey) (Figure SF1). LNG trade expanded by 44 percent between 1990 and 1996, rising from 2.6 trillion cubic feet (Tcf) to 3.6 Tcf.

The countries with the largest LNG consumption are in Asia, which imported more than 2.8 Tcf of LNG in 1996 (Table SF1). Japan is by far the largest user of LNG, importing in 1996 almost two-thirds of the world's 3.6 Tcf of LNG production (Figure SF2). South Korea is a distant second with 13 percent of the total, followed by Taiwan with 3 percent. Together this region imported more than three-quarters of the total production of LNG in 1996. The needs of this region remain the focus of the story with respect to the growth potential of LNG.

Despite the success of individual LNG projects and the regional importance of LNG, overall, LNG accounts for only 5 percent of world natural gas consumption. It has had only a marginal influence on world patterns of gas consumption thus far. It is useful to start this discussion of LNG with a look at the overall market for natural gas to put the needs of potential LNG users into perspective.

Growing Demand for Natural Gas Is Expected Worldwide

The role of natural gas in the world's energy supply is growing rapidly. According to the *International Energy Outlook 1997* (*IEO97*) published by the Energy Information Administration in April 1997,[1] total world natural gas demand is expected to reach 145 trillion cubic feet by 2015, an 85-percent increase over the 1995 level of 78 trillion cubic feet. The *IEO97* does not identify the LNG portion of this consumption, because the model used to generate natural gas consumption projections does not distinguish the form gas takes before it is consumed. The *BP Statistical Review of World Energy 1997* estimated that LNG represented 4.6 percent of the total world consumption of natural gas in 1996.[2] Over the next two decades, gas use is projected to rise at more than three times the rate for oil use. The growth in natural gas consumption is equivalent to more than 33 million barrels of oil per day. In comparison, oil use in 2015 is projected to be 35 million barrels per day higher than in 1995. Resource availability, cost, and environmental considerations all favor growing reliance on gas in industrial applications and electricity generation, and natural gas is replacing other fuels in residential and commercial sector uses as well.

The highest growth rates in natural gas demand are projected for the developing countries of the world, where overall demand in the *IEO97* reference case rises by 5.0 percent annually between 1995 and 2015 (Figure SF3). Developing Asia is expected to experience annual gas consumption increases of almost 8 percent. Much of this growth will fuel electricity generation in the region, but infrastructure projects are also underway for natural gas to displace polluting home heating and cooking fuels in major cities such as Bombay, Shanghai, and Beijing. These areas have limited access to gas

Figure SF1. Major LNG Flow Routes, 1997

Source: British Petroleum Company, *BP Statistical Review of World Energy 1997*.

Table SF1. Trade Movements 1996 - Liquefied Natural Gas
(Billion Cubic Feet)

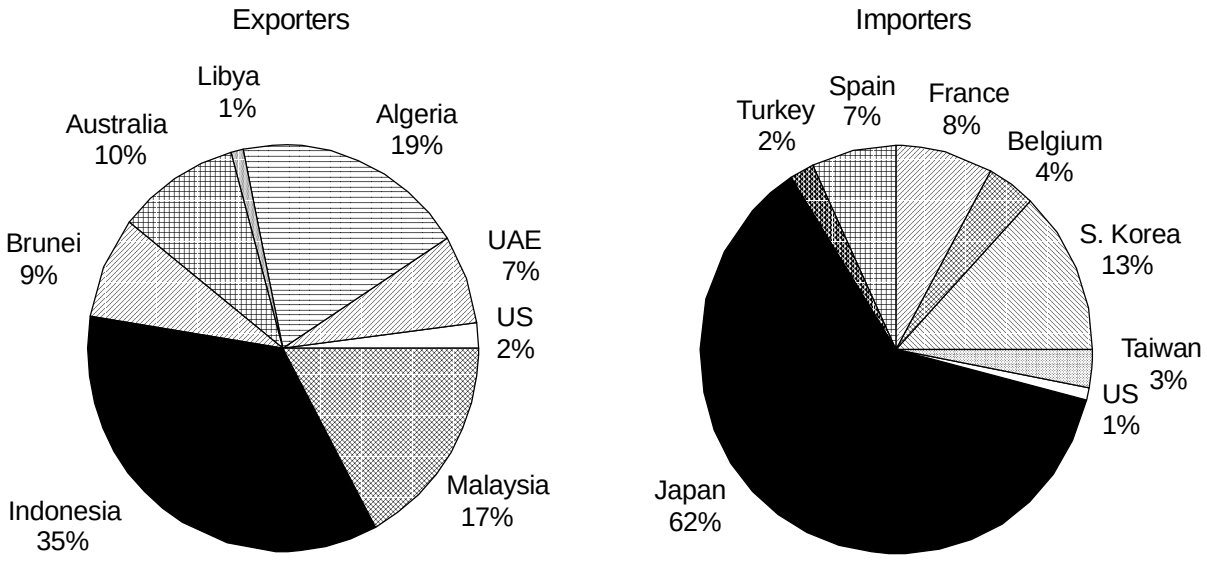
	From								
To	**USA**	**UAE**	**Algeria**	**Libya**	**Australia**	**Brunei**	**Indonesia**	**Malaysia**	**Total Imports**
North America									
USA	-	7.1	35.3	-	-	-	-	-	42.4
Europe									
Belgium	-	*	141.3	-	-	-	-	-	141.3
France	-	7.1	268.4	-	-	-	-	-	275.5
Spain	-	31.8	169.5	42.4	*	-	-	-	243.7
Turkey	-	-	77.7	-	3.5	-	-	-	81.2
Asia Pacific									
Japan	63.6	211.9	-	-	353.1	271.9	900.5	452.0	2,253.1
South Korea	-	-	-	-	3.5	35.3	300.2	123.6	462.5
Taiwan	-	-	-	-	-	-	70.6	49.4	120.1
Total Exports	**63.6**	**257.8**	**692.2**	**42.4**	**360.2**	**307.2**	**1,271.3**	**625.1**	**3,619.7**

*Less than 2 billion cubic feet.

Note: Sum of components may not equal total because of independent rounding.

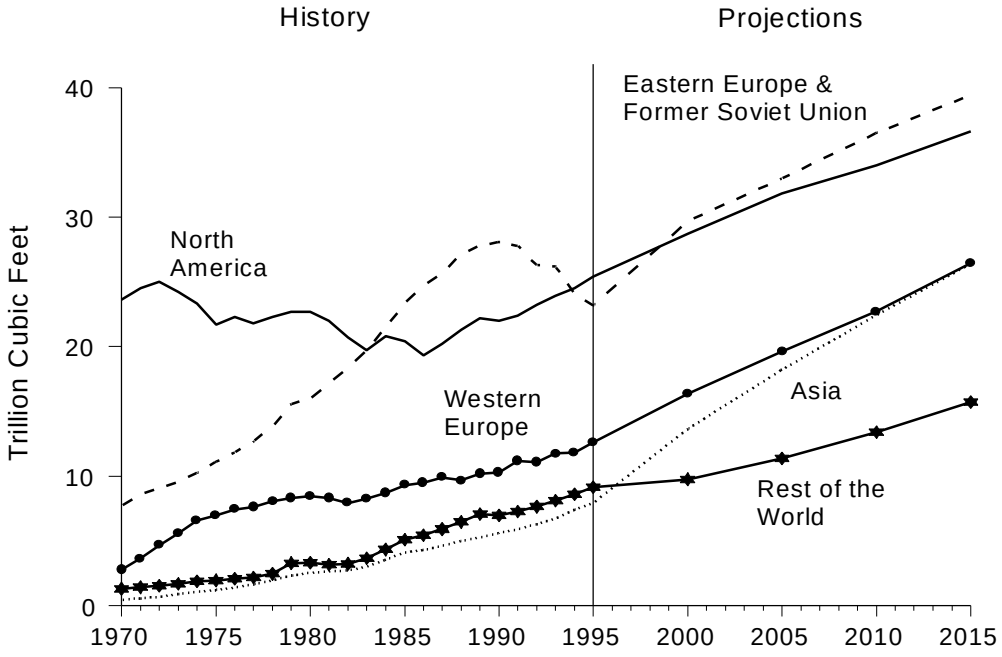
Source: Energy Information Administration, Office of Oil and Gas, derived from the British Petroleum Company, *BP Statistical Review of World Energy 1997*.

Figure SF2. 1996 LNG Trade



Source: British Petroleum Company, *BP Statistical Review of World Energy 1997*.

Figure SF3. Natural Gas Consumption by Region, 1970-2015



Source: Energy Information Administration, *International Energy Outlook 1997*.

supply sources and are candidates for additional LNG development. Their needs are discussed in a later section. Gas markets in Central and South America also are expected to undergo substantial development during the forecast period, with consumption increases of about 5.3 percent annually. Much of the additional consumption will be used to supply the region's growing needs for electric power and industrial energy. Heretofore the region has relied heavily on hydroelectric power, and natural gas use will permit substantial diversification in energy use for power generation.

Industrialized countries, where natural gas markets are most mature, will also increase their reliance on natural gas. Over the next two decades, demand in the industrialized countries is expected to grow by 2.6 percent annually, more than twice the rate of increase in oil use. In the United States, gas demand is expected to rise by 1.7 percent annually, mainly because of growth in gas-fired electricity generation.

Among the industrialized regions, Western Europe is projected to have the highest growth rate in gas use, at 3.8 percent. Privatization and restructuring of the electric utility sector in many countries of Western Europe have resulted in plans to increase the use of natural gas for generating electricity. Further, many nations of Western Europe view natural gas use as a way to decrease greenhouse gas emissions. European governments are encouraging the development of gas infrastructure in an attempt to move away from reliance on the more carbon-intensive coal and oil.

In Eastern Europe and the former Soviet Union (EE/FSU), gas consumption is expected to rise by 2.7 percent annually. Much of the projected growth in this region is attributed to the countries of Eastern Europe, where economic recovery occurs more rapidly over the forecast period than in the FSU. Eastern Europe's gas demand grows by 5.2 percent per year in the forecast, whereas continued slow economic growth in the FSU leads to a more modest annual rate of 2.3 percent. Total gas demand in the EE/FSU rises by 70 percent over the forecast period. An infrastructure that is fast becoming integrated with the gas system of Western Europe supports the growth in East European gas use.

Even Greater Demand for Natural Gas May Result If Caps on Carbon Emissions Are Put into Place

A significant uncertainty that was not addressed in the *IEO97* projections is the potential for caps on carbon emissions. The same level of energy derived from burning natural gas saves 50 percent of carbon emissions relative to coal and 30 percent relative to oil. Thus, if the world's governments move to policies that cap carbon emissions, substantial fuel substitution is likely. From a resource standpoint, natural gas could support even higher growth rates than currently projected, as potential sources of natural gas supply are far larger than those currently identified as proved reserves. Proved reserves represent producible gas in known fields that have access to infrastructure to move gas to market. The level of proved reserves worldwide could be vastly expanded by developing the infrastructure capacity.

Potential Supplies Are Substantial But Growth of Natural Gas Is Hindered by Infrastructure Requirements

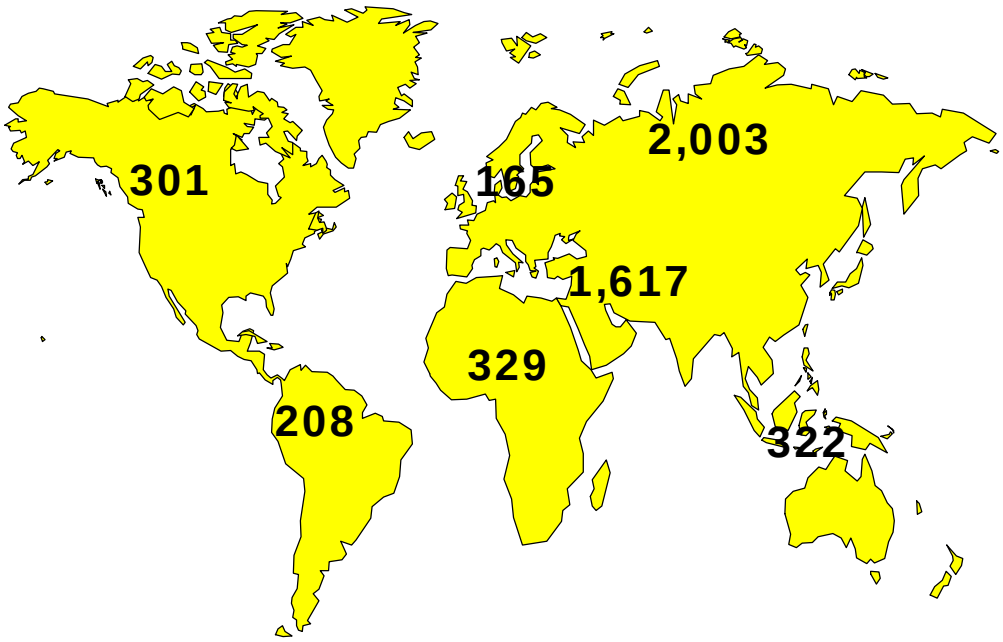
As of January 1, 1997, the world's proved world natural gas reserves[3] were estimated to be 4,945 trillion cubic feet (Figure SF4), 11.6 trillion cubic feet more than the estimate for 1996. Whereas natural gas reserves have declined slightly in the industrialized countries during the past decade, they have increased fairly dramatically in the EE/FSU and in the developing countries (Figure SF5). Between 1995 and 1996, gas reserves in the Middle East grew by 20 trillion cubic feet, whereas the combined reserves of Africa, Western Europe, and Asia declined by about 19 trillion cubic feet.

About 73 percent of the world's proved gas reserves are located in the FSU and the countries of the Middle East (Figure SF6). Reserves in the industrialized countries of the world have remained fairly stable over the past 20 years, although they have fallen continuously since 1993. On the other hand, reserves in the EE/FSU and developing countries have more than doubled.

Natural gas reserves are less geographically concentrated than oil reserves worldwide. Further, despite high rates of increase in gas consumption, especially over the past decade, regional reserves-to-production ratios tend to be high, indicating excess capacity and the potential for greater exploitation of this resource. For example, Central and South America have a reserves-to-production (R/P) ratio of 73.9 years, the EE/FSU 80.4 years, and the Middle East more than 100 years.[4] In contrast, the United States and Canada had R/P ratios for 1995 of 9.2 and 12.8, respectively.[5] Additionally, in many areas, deposits of gas are known to exist but are not counted as reserves because the infrastructure needed to gather and distribute the gas is not available.

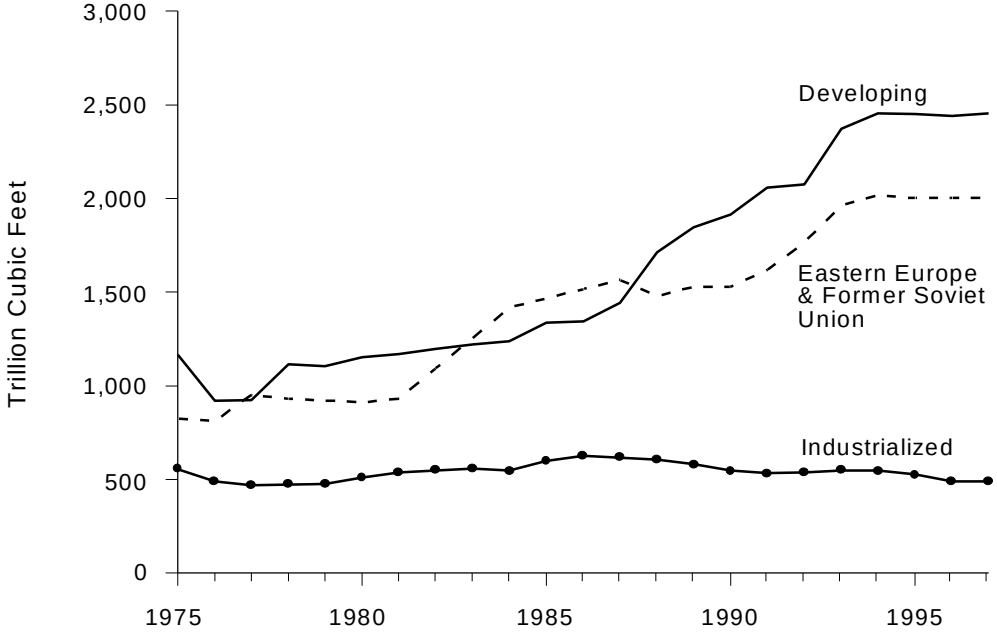
Lack of infrastructure is the major barrier to increased worldwide gas consumption. Most gas presently moves

Figure SF4. Global Gas Reserves as of January 1, 1997
(Trillion Cubic Feet)



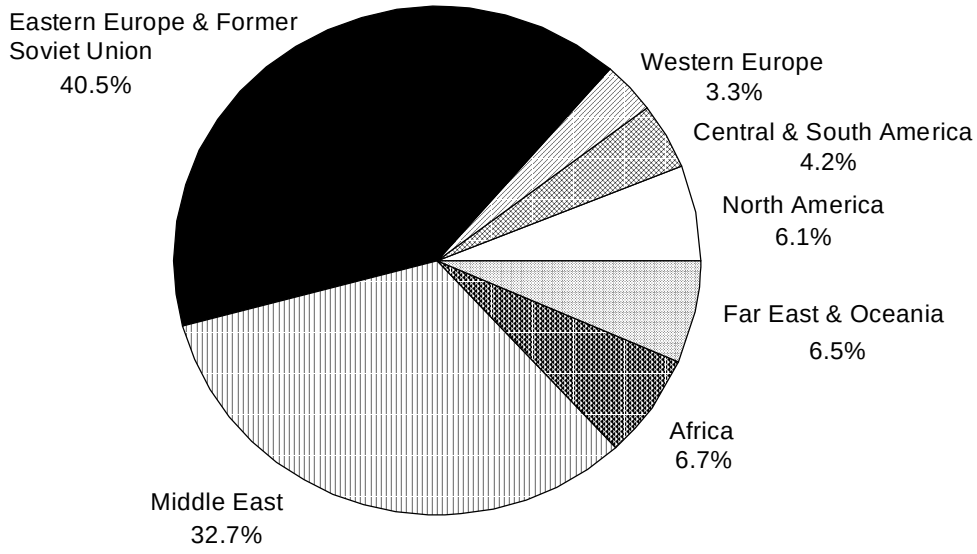
Source: *Oil and Gas Journal* (December 30, 1996).

Figure SF5. World Natural Gas Reserves by Region, 1975-1997



Sources: **1975-1996:** "Worldwide Oil and Gas at a Glance," *International Petroleum Encyclopedia*, various issues. **1997:** "Worldwide Look at Reserves and Production," *Oil and Gas Journal*, (December 30, 1996), pp. 40-41.

Figure SF6. Regional Distribution of Global Gas Reserves



Source: *Oil and Gas Journal* (December 30, 1996).

by pipeline, which requires proximity to demand areas and the ability to lay pipe over reasonable terrain. Throughout the world, major efforts are proceeding to expand gathering, transmission, and distribution capacity in order both to promote and support the projected growth in natural gas demand. In 1996, more than 12,000 miles of new natural gas pipeline were completed,[6] and an additional 15,000 miles were under construction. Regionally, more than 50 percent of ongoing pipeline construction activity is in South America and Asia—areas that currently account for less than 15 percent of the world's gas consumption. Proposals and plans for further infrastructure expansion are numerous. Enron in 1995 cataloged project proposals involving the construction of 300 or more miles of pipeline per project.[7] Nearly 400 such projects were identified, involving 77,000 miles of additional construction.

The largest of the proposals calls for a pipeline network that would link all of the gas producing and consuming nations of the Pacific Rim of Asia—the same region that accounts for the bulk of the world's LNG imports. The proposed pipeline network would stretch thousands of miles from Australia and New Zealand north to Southeast Asia, China, Taiwan, South Korea, Japan, and Russia. Because of the huge expense and major logistical problems that are involved, this proposal is not very likely to become a reality over the next 20 years. However, plans are being made to build one component of the proposed network—pipelines linking gas supplies from the Russian Far East to China and other nearby countries such as Japan. On June 27, 1997, China and Russia agreed to a $5 billion project to develop gas reserves for export to China; under this project, Russia eventually would ship almost 1 trillion cubic feet of natural gas annually to China. The dynamic to expand infrastructure to utilize abundant natural gas resources is strong and will result in many more miles of pipeline development beyond the 15,000 miles of construction currently underway. Still, there are many areas of the world where pipeline construction from supply to demand areas is currently not an option and LNG transport is presently the only way to accommodate the development of these supply areas and markets.

LNG Consumption Appears To Be Increasing Even More Rapidly Than Consumption of Piped Gas

LNG consumption appears to be increasing even faster than that of piped gas, making it likely that the LNG share of total gas will rise over the next 10 to 15 years. LNG markets appear to be entering a new round of expansion, with a more diversified range of customers and suppliers. The largest proportion of increased LNG use will occur in Japan, South Korea, and several newly industrializing Asian countries, including India, Thailand, and perhaps China. There are a growing number of LNG supply contracts worldwide—despite

the fact that average LNG prices tend to be higher than prices of competing fuels—primarily because it is environmentally a clean fuel (compared with coal and oil) and its markets tend to be where pipelines are unavailable.

LNG is a major share of the total natural gas consumed in several countries of the world, particularly in Asia. LNG accounts for more than 97 percent of Japan's total natural gas consumption.[8] The bulk of Japan's LNG currently comes from Indonesia, although supplies are also imported from Australia, Brunei, Malaysia, the United Arab Emirates, and the United States (68 billion cubic feet in 1996).[9] In 1996, Japan further diversified its supplies by signing a long-term agreement with Qatar. The January 10, 1997 delivery of 65,000 metric tons (about 3.2 billion cubic feet) of LNG marked the entrance of Qatar into the industry.[10] Many analysts see the agreement between Qatargas and Chubu Electric Power of Japan as a major industry milestone. Qatargas is contracted to supply Chubu with up to 6 million metric tons of LNG per year (292 billion cubic feet) for a 25-year period. This is the first of three projects under way to export up to 12 million metric tons of gas (584 billion cubic feet) per year from Qatar's North Field by 2000. The second project, Ras Laffan LNG, is under construction and is scheduled to be onstream by mid-1999.

South Korea is the second largest consumer of LNG (following Japan) worldwide.[11] Virtually all natural gas consumed in South Korea is LNG. South Korea began importing LNG about 10 years ago in order to provide a cleaner alternative fuel to the electric utility sector, which has continued to provide much of the growth in gas consumption since that time.[12] About 10 percent of electricity generation in South Korea is attributable to gas.[13] The Korea Gas Corporation (Kogas) is currently increasing gas supplies to residential, commercial, and industrial users through 32 local natural gas and liquefied petroleum gas distributors.[14] Fifteen of these distributors already supply gas to end-use sectors other than electric utilities. In the future, the electric utility sector is expected (by Kogas) to lose share to the rapidly growing (mostly) residential sector use. The residential sector share of natural gas use is expected to grow from 34 percent to 40 percent between 1996 and 2010. Kogas plans to expand its gas trunkline from 2,200 miles to 3,700 miles by 2006. The company has estimated that LNG imports will more than triple between 1996 and 2010.

Both Japan and South Korea have plans to increase reliance on nuclear power, as well as natural gas, to meet their energy needs. Japan's nuclear power consumption is expected to grow by 32 percent between 1995 and 2015, and South Korea's by 120 percent. Natural gas demand in Japan will increase by 83 percent over the next 20 years according to EIA's *International Energy Outlook 1997*. The Korea Energy Economics Institute projects that LNG consumption in South Korea will grow by 173 percent over the next 15 years alone.

Plans for nuclear expansion in these two countries may be constrained as a result of growing public opposition to the industry. In Japan, a municipal referendum seeking public approval for construction of a nuclear power station in Maki, Niigata, was rejected by local residents in August 1996. Moreover, the March 11, 1997 fire and explosion at a low-level radioactive waste-processing plant at Tokai Mura near Tokyo may increase public concern about Japan's nuclear plans. Public opposition to nuclear power has also been seen in South Korea, where demonstrations have been held to protest an agreement between Taiwan and North Korea to ship Taiwan's low-level radioactive waste to North Korea for storage.

There is expanding interest in LNG in several other countries of developing Asia. Thailand and India, in particular, have major plans for establishing LNG supplies. Thailand signed contracts with Oman to begin shipments of LNG in 2003.[15] At the end of 1996, India's state-owned Gas Authority of India, Ltd., made an international call for LNG supplies as part of a $10 billion project to diversify its energy sources.[16] The government has identified LNG as a long-term fuel for the electric power sector and plans to set up two regasification plants: one at Ennore, near Madras, on India's southern coast and one at Mangalore on the western coast. India's Gas Authority has begun talks with Qatar's Ras Laffan LNG Company in an attempt to secure 5 million metric tons (244 billion cubic feet) of LNG for the planned projects.

Four more LNG import terminals could be developed in India besides the two planned at Ennore and Mangalore in the southern part of the country. Paradip and Visakhapatnam on the east coast and Kandla and New Mumbai on the west coast are locations for additional terminals for import of 2.5 million metric tons per year (122 billion cubic feet) each. Each could cost about $1.1 billion, and all the new terminals could be online by 2005. India would like to import LNG both from Persian Gulf and southeast Asian countries.

Even China may emerge as a market for LNG. Shanghai is seeking foreign funds and technology to help build a $300 million LNG storage unit.[17] The city wants to reduce its reliance on coal in favor of cleaner energy sources.

According to the Shanghai Planning Commission, coal currently meets 72 percent of Shanghai's fuel needs, and consumption is projected to reach 60 million metric tons per year by 2000 and 90 million metric tons per year by 2010. To diversify fuel use, Shanghai would import 3 million metric tons (146 billion cubic feet) of LNG per year. A prospective LNG project would take an estimated 5 years to complete and would import gas from Southeast Asia and Australasia.

European buyers of LNG include the Western European countries of Turkey, France, Belgium, and Spain.[18] LNG accounted for 81 percent of Spain's total natural gas consumption in 1995. However, pipeline connections to Algeria and to the European grid will cause LNG to lose share in Spain to conventional gas sources in coming years. Demand for LNG in Western Europe may grow by as much as 155 million metric tons (7.5 trillion cubic feet) per year by 2010, around 90 million metric tons (4.4 trillion cubic feet) of which are covered by existing supply contracts.[19] Some 50 million metric tons (2.4 trillion cubic feet) of European LNG demand could be met by supplies from the Middle East. The Atlantic LNG project currently under construction in Trinidad, scheduled for completion in 1999, is expected to market a large part of its output to Spain and the Northeast United States.

In the United States, LNG accounts for a small portion of total gas consumption. This is not expected to change materially over the next decade, although some increase in purchases is expected, especially once the Trinidad project comes online in 1999. In addition, most major heavy-duty engine manufacturers have plans to build and test LNG engines for use in large trucks.

LNG Is a Costly Option Requiring Large Capital Investments

Although worldwide gas inputs for LNG facilities are relatively cheap—based on large and easily produced reserves—processing and transportation equipment is capital intensive and highly specialized, requiring billions of dollars of investment for each new facility. For each million cubic feet of gas delivered to end users, less than 30 percent of the cost is associated with resource supply. The balance reflects the costs of processing and transportation.[20]

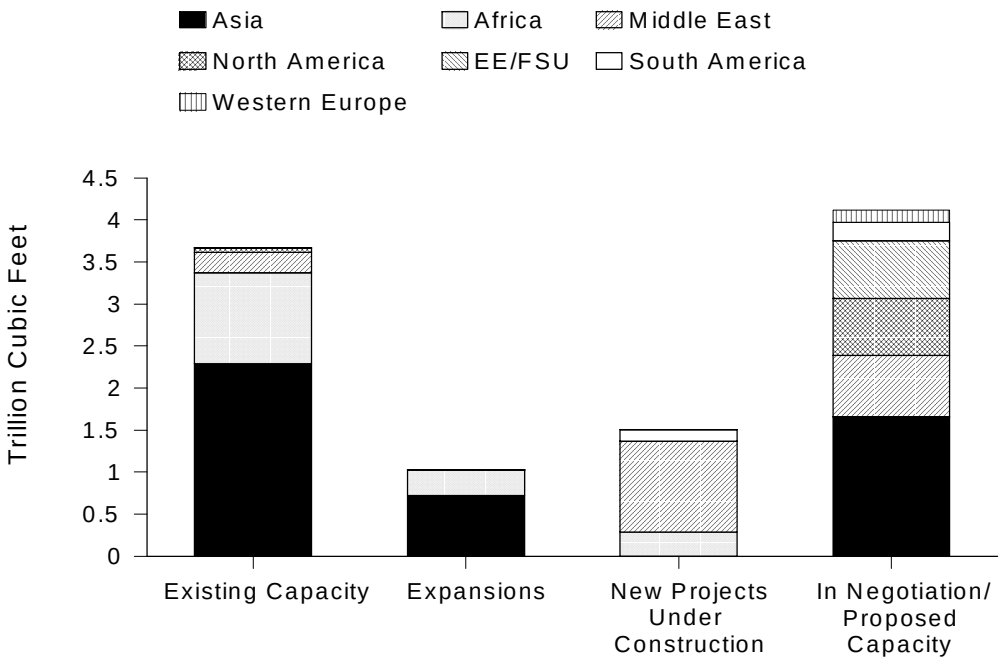
Existing liquefaction plants currently account for more than 3.6 trillion cubic feet of capacity per year (Figure SF7). Planned extensions to existing capacity involve additions of more than 1.0 trillion cubic feet of capacity. New projects under construction should add another 1.5 trillion cubic feet of capacity. Additional prospective capacity additions ranging between 1.4 and 4.1 trillion cubic feet are in various stages of planning and negotiation.[21] Thus, it is possible that worldwide LNG processing capacity could nearly triple in the next decade or so. Much of the proposed capacity will be in Asia where liquefaction capacity has the potential for more than doubling, to total more than 4.6 trillion cubic feet (Tcf) per year (Figure SF8). The Middle East, where capacity currently stands at 0.2 Tcf per year, has projects under construction that will bring total capacity to nearly 1.3 Tcf per year, with an additional 0.7 Tcf being considered for post-2000.

LNG projects comprise several distinct elements, each of which is necessary to implement a successful project:

- **A large, low-cost source of natural gas.** A successful LNG project must have sufficient proved reserves of natural gas to support liquefaction capacity for 15 to 20 years. To ensure adequate "deliverability" of gas even at the end of the project, reserves ought to be 25 to 35 times larger than the annual capacity of the plant. For example, a 500-million-cubic-foot-per-day project would require proved reserves of 5.48 to 7.67 trillion cubic feet.[22] In addition, production costs (including applicable production taxes levied by the host government) need to be low—typically, less than $1.00 per million Btu, and preferably on the order of $0.50 per million Btu. On the other hand, if natural gas production yields significant volumes of condensate or natural gas liquids, the revenues from petroleum coproduction may be sufficient to cover the cost of natural gas production, permitting the LNG project to be economically viable despite low natural gas feedstock prices. Extracting liquids and condensates, while usually profitable, exacts a volumetric cost. Typically, 10 percent or so of gross gas production disappears in the form of extracted liquids and nonhydrocarbon gases. Thus, gross production must exceed the volume of gas delivered to the liquefaction plant by the amount of shrinkage.

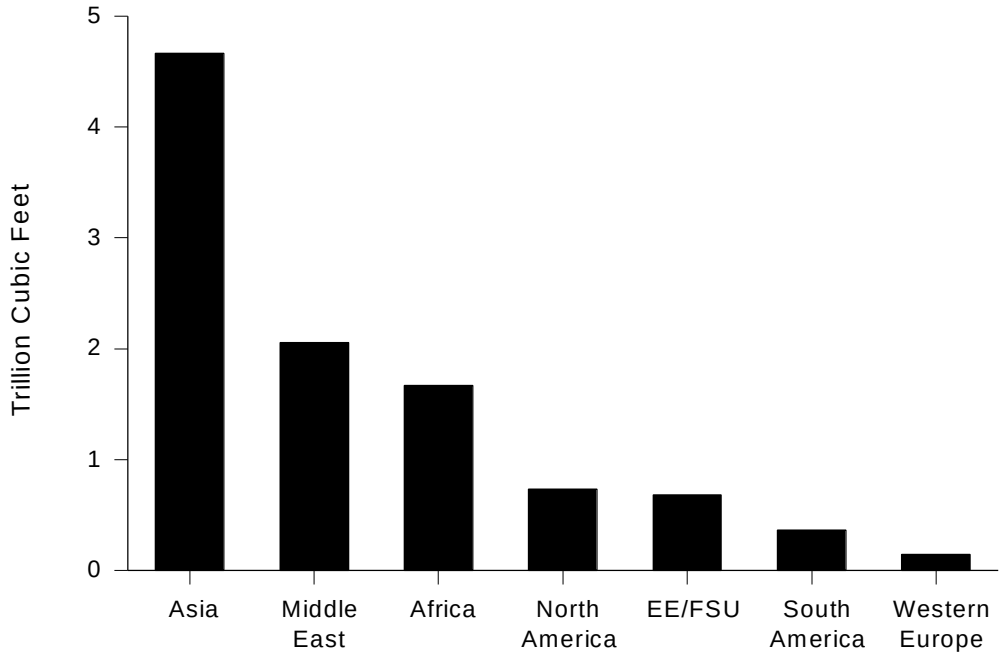
- **A liquefaction facility, including a jetty and loading facilities for LNG tankers.** The liquefaction plant is typically the most expensive element of an LNG project. The cost will depend on a host of site-specific factors and on project scale, with larger projects having lower unit costs. As a rule of thumb, $300 to $900 million of capital cost for each 1 million metric tons per year (about 133 million cubic feet per day) of capacity seems to be typical of current projects.[23] How this capital cost is distributed over the life of an LNG project will depend on a host of financing

Figure SF7. Status of Worldwide LNG Capacity: Existing, Planned, and Potential as of 1996



Note: EE/FSU = Eastern Europe & Former Soviet Union.
Source: Petroleum Economist Ltd., *Petroleum Economist*.

Figure SF8. Potential for World Liquefaction Capacity by Region as of 1996



Note: EE/FSU = Eastern Europe & Former Soviet Union.
Source: Petroleum Economist Ltd., *Petroleum Economist*.

details and inflation assumptions, though principally on the developer's target rate of return on capital. Operating costs are relatively minor. Liquefaction is a very energy-intensive process. Typically, about 8 to 9 percent of the natural gas delivered to an LNG plant is used as plant fuel, but as noted above, the cost of the natural gas delivered to the liquefaction plant is inherently very low.[24]

- **LNG Tankers.** Each project requires several dedicated LNG tankers, which are among the most complex and expensive merchant ships ever built, because of their double hulls and special lining. Each new 135,000 cubic meter (3 billion cubic foot) capacity tanker costs on the order of $260 million. The number of tankers required for a project depends primarily on the distance between the liquefaction plant and the customer. In general, transportation costs increase linearly with distance. Other less important issues include the cost of bunker fuels for the tanker and the cost of arrangements for spare transport capacity when dedicated tankers are being refitted. Finally, the tanker's LNG cargo is kept cool by evaporating a fraction of the cargo ("boiloff") and burning it as boiler fuel. Typically, about 0.15 to 0.25 percent of the cargo is consumed per day, during which the tanker will travel about 480 nautical miles.[25] Thus, moving LNG from the Persian Gulf to Japan (about 7,000 nautical miles) consumes about 3.6 percent of the cargo (see Box, "LNG Transport Distances and Associated Gas Losses").

- **Regasification Plant.** LNG can be unloaded only in specialized terminals, which typically include a jetty and unloading facilities, LNG storage equal to at least a single tanker cargo, regasification facilities, and connections to pipelines. The cost of the regasification terminal varies with capacity, local construction costs, and the amount and type of site preparation costs, but it would be in the range of several hundred million dollars. Regasification plant costs are typically considerably lower than liquefaction plant costs. At present, there are regasification plants in most major consuming markets. Opening up LNG markets in new countries (for example, China or the Philippines) would require a considerable initial infrastructure investment. A U.S. Department of Energy study estimated the capital cost of a new regasification plant at $700 million (1988 dollars) for a 500-million-cubic-foot-per-day facility, equivalent to $0.56 per thousand cubic feet. Regasification energy requirements will also consume a further 2.5 percent of the delivered LNG. The marginal cost of using an existing regasification plant with excess capacity, or expanding the capacity of an existing plant, would be far lower than the cost of building a new "greenfield" facility.

The large capital costs of each link in an LNG project impose their own logic. Projects can be undertaken only by large organizations with sufficient financial capacity and strong project management skills. A typical customer would be a mid-sized natural gas distribution company with 50,000 to 100,000 customers. A successful project requires the cooperation of the host government (where the gas resources are located), the entity that owns the natural gas rights (private or state), the government of the consuming country, consuming organizations (national or private electric utilities, gas companies, etc.), and a host of specialized organizations, including shipyards, financiers, tanker operators, construction companies, and process technology licensors. Agreement must be reached *in advance* regarding the distribution of the costs, the benefits, and the considerable risks associated with the project. Reaching these agreements generally requires protracted negotiations, as well as considerable upfront expense for risk-reducing feasibility and engineering design studies.

No LNG project is likely to proceed unless the developers receive some assurance that they will be able to earn an acceptable return on their multibillion-dollar investments. A successful LNG project requires a price that is low enough to motivate consumers to use large volumes of natural gas, backing out fuel alternatives, yet still high enough to persuade developers and borrowers to actually build the project. LNG developers will seek (but not always find) a long-term contract for their product at a price that is sufficient to cover their capital costs, which includes "take or pay" and "floor price" arrangements to ensure that the project can service its debts even in a lower-than-anticipated energy price environment.[26] It is also common for consumers to be offered or to take an equity stake in LNG projects, so as to encourage a common interest among the buyers and the sellers.

From the above review, it is clear that LNG project costs can vary considerably, particularly with respect to the effects of local construction costs. As a summary estimate, however, a successful LNG project might have production costs of $0.50 per million Btu, liquefaction costs of $2.50 per million Btu, and transport costs of $0.75 per million Btu, for a typical project cost of perhaps $3.75 per million Btu delivered to the regasification plant. The actual delivered cost of LNG to Japan under a mix of spot and long-term contract arrangements to Japan is typically $3.00 to $4.00 per million Btu.[27]

LNG Transport Distances and Associated Gas Losses

Moving LNG long distances incurs an inevitable loss of a portion of the cargo. Evaporation from the cargo, or boiloff, supplies most of the ship's fuel needs. Losses in transit clearly reduce the value of the shipment. Volumes lost depend on a number of factors such as distance, ship speed, and the boil-off rate. These factors may vary for many reasons including the age of the vessel and the weather conditions during the voyage, but the distance seems to be the primary determinant.

Distances and estimated losses for routes between various supply locations and the two operating U.S. LNG import facilities are shown in the following table. In addition, values associated with shipments to Japan from selected source locations are provided in the third section of the table. The proximity of Alaska to Japan gives it a comparative advantage in shipping gas losses relative to supplies from Middle East sources.

From	To	Distance (approx. miles)	Gas Losses (as fraction of shipment)
Algeria	Everett, MA	3,303	1.7%
UAE	Everett, MA	7,871	4.1%
Australia	Everett, MA	11,874	6.2%
Venezuela/Trinidad	Everett, MA	2,075	1.1%
Algeria	Lake Charles, LA	4,962	2.6%
UAE	Lake Charles, LA	9,533	5.0%
Venezuela/Trinidad	Lake Charles, LA	2,275	1.2%
Persian Gulf	Japan	7,000 (1)	3.6%
Indonesia	Japan	2,400 (2)	1.3%
Alaska	Japan	3,200 (3)	1.7%

Note: Gas losses were derived based on an assumed tanker speed of 20 nautical miles per hour and gas losses of 0.25 percent per day.

Source: Energy Information Administration (EIA), Office of Oil and Gas. All distances are from *Potential for Long-Term LNG Supply*, Arthur D. Little (August 1991) prepared for Gas Research Institute, except for: (1) EIA Office of Integrated Analysis and Forecasting as published in *Issues in Midterm Analysis and Forecasting 1997* (July 1997); (2) EIA Office of Oil and Gas, derived from *Distances Between Ports: 1965*, U.S. Naval Oceanographic Office (1965);and (3) Yukon-Pacific Corporation submission on the Trans-Alaska Gas System (TAGS) to the National Petroleum Council (1991).

Recent Market Developments Have Improved the Prospects for Future Growth

Several interesting market developments in the LNG business have created a modest boom in LNG operations, improving the prospects for future growth. LNG projects, as previously noted, have generally been based on a firm supply contract between buyer and seller, in which the buyer is required to "take or pay," while the seller is required to "deliver or pay." LNG projects are thus designed to deliver the contractual amount of gas with a high degree of reliability. In practice, this has meant designing-in excess capacity, so that excess liquefaction capacity is available most of the time and "spare" tankers are available to cover scheduled overhauls. The cost of this excess capacity is embedded in the project's main contracts. Consequently, many LNG producers have volumes of LNG available in excess of contract volumes, for which the marginal cost of production and transportation is a fraction of the full cost of the main contract volumes. Producers have proven willing to sell these volumes at competitive prices on a developing "spot" market

Spot trading in LNG currently accounts for about 3 percent of the total market, compared with nearly zero volumes as recently as 1992.[28] In the United States, the Boston-based Cabot Corporation has signed an

agreement with Australia's Northwest Shelf LNG project to purchase three cargoes of LNG on a spot sales basis. The first shipment of 2.5 billion cubic feet was delivered in May 1997 with two additional shipments scheduled for later this year. In an attempt to enter the European LNG market, Qatar's Qatargas LNG project plans to sell spot cargos to Europe beginning in September 1997.[29]

Development of the LNG spot market has also been stimulated by other events. Contract disputes between buyers and sellers occasionally have made LNG from existing plants unexpectedly available. Further, some LNG projects are now old enough so that their original 20-year supply contracts have expired. The owners of these projects have considerably more pricing flexibility than owners of prospective future projects. Projects that have collapsed have produced a flock of uncommitted LNG tankers available for spot charter or sale at a fraction of construction cost. As of 1993, one source estimated that nine large LNG tankers (14 percent of the worldwide fleet) were idle.[30] Finally, the cost of adding incremental capacity to existing plants is often considerably lower than building a new plant. This has paved the way for the expansion of the market through lower cost "capacity creep." The Institute for Energy Economics of Japan estimates that typical capacity for existing LNG liquefaction plants may be as much as 25 percent in excess of rated "nameplate" capacity.[31] In the United States, the Everett, Massachusetts, LNG regasification plant operates at 30 billion cubic feet of its full capacity of 92 billion cubic feet. By 1999, this facility is expected to reach full capacity, potentially expanding to 140 billion cubic feet by 2005. Expansion at the Lake Charles, Louisiana, regasification facility is also possible; the Cove Point, Maryland, and mothballed Elba Island, Georgia, facilities could be reopened for LNG importation under the right economic circumstances.

The development of the LNG spot market has also led to an apparent relaxation of constraints on new project development. Rather than nailing down project volumes through a set of long-term contracts, operators in the 1990s have proven willing to go ahead with projects in the absence of long-term contracts for the full volume, in the faith that sufficient additional contracts will ultimately materialize, or, at worst, that a portion of the product can be sold (perhaps at a discounted price) on the spot market. Thus, the development of an LNG spot market has apparently reduced the volume risk inherent in new LNG projects.

LNG holds considerable potential for future natural gas trade, which can be unlocked in several different ways:

- Countries such as Thailand, Brazil, the Philippines, China, and India may elect to build regasification facilities in the future.
- LNG capital costs may continue to decline with improving technology. The minimum efficient scale for LNG projects may decline, creating opportunities for smaller export projects.
- The development of an active spot market with more exporters and importers may improve utilization rates on expensive fixed liquefaction and transport capacity, as well as reduce project risk.
- Markets for premium-priced "clean" fuels may expand in current and potential consuming countries with increasing wealth and increasing public concern about air quality or greenhouse gas emissions.
- LNG use to cover peak consumption periods and to enhance gas system reliability may grow.

LNG projects, however, are not created in a vacuum. They must compete with other fuels and even with other gas export technologies. Today LNG projects compete against coal and petroleum products in power generation markets and, potentially, against "town gas," middle distillates, and liquefied petroleum gas in smaller premium residential markets.

Alternative Technologies for Moving Natural Gas from Supply Sources Are Actively Being Investigated

LNG is only one way to move natural gas from remote sources to market areas. Gas marketing alternatives to LNG that may or may not be superior must be considered in any assessment of the long-term potential for LNG and natural gas, although the future impact of these alternatives cannot be determined with precision at present. There are a number of options for marketing natural gas, which depend either on converting the gas into another product or the use of alternative approaches to natural gas transportation.

Gas-to-Liquids Technology for Conversion to Petroleum Products

Gas-to-liquids technology (GTL) refers to the conversion of natural gas into synthetic hydrocarbon liquids, particularly middle distillates.[32] With the transportation market, particularly in Europe, emphasizing the use of diesel fuel, rather than gasoline, this process is an interesting alternative for developing natural gas

Carbon Emissions from GTL-Produced Synthetic Diesel

A key issue in the supply and consumption of any fuel is the resulting relative environmental impact. Carbon emissions associated with the supply and combustion of 1 quadrillion Btu of natural gas- or petroleum-based fuels can vary widely from 18.4 million metric tons for compressed natural gas (CNG) to 26.8 million metric tons for synthetic-derived diesel fuel based on gas-to-liquids (GTL) technology (see following table). These estimates are based on supplying 1 quadrillion Btu of energy to the consumer (excluding delivery) and its use; thus they account for carbon content of the original fuel and conversion losses.

Generally, the carbon caused by the supply and use of either petroleum- or synthetic-derived diesel is comparable, and that from natural gas is comparable whether it is used as CNG or LNG. Carbon emissions from the consumption of 1 quadrillion Btu of natural gas are less than those from diesel, however, the consumption efficiency of each fuel must be recognized. For example, better transportation efficiency of diesel generally offsets this benefit, resulting in no clear advantage in carbon emissions per mile traveled for either of the four fuels when consumed in transportation.

Carbon Produced from Supply and Use of 1 Quadrillion Btu, by Fuel

Fuel	Million Metric Tons of Carbon
Petroleum-based diesel	25.5
Synthetic diesel derived from natural gas	26.8
Compressed natural gas	18.4
Liquefied natural gas	19.4

Source: Energy Information Administration, Office of Oil and Gas, derived from assumptions and methodology provided by the Department of Energy's Office of Fossil Energy.

supplies. Petroleum products are far easier to transport and market than LNG. They can be moved in existing pipelines or products tankers and blended with existing crude oil or product streams. No special contractual arrangements are required to sell them, and there are numerous suitable domestic and foreign markets. The key to the economics are the capital and operating costs of the plant, feedstock costs, and, secondarily, the ability of the operator to achieve high utilization rates. Owners of natural gas reserves will naturally be interested in whether LNG or gas-to-liquids plants yield the largest return on investment. Current economics and technology favor increased conventional crude oil production, but GTL technology provides an economically viable option for exploiting remote gas deposits without exceeding crude oil production quotas (see Box, "Carbon Emissions from GTL-Produced Synthetic Diesel").

Currently Royal Dutch/Shell operates a project at Bintulu (Malaysia) with a capacity to produce 12,500 barrels per day of middle distillates from 100 million cubic feet per day of natural gas. Other projects under development include two in Qatar. One project is being negotiated between Exxon and Qatar aimed at producing 50,000-100,000 barrels per day of middle distillates, naphtha, and catalytic cracker feedstock from 500 to 1,000 million cubic feet per day of gas. This project is expected to cost from $1.2 billion to $2.4 billion and will rely on Exxon's Advanced Gas Conversion Technology 21st Century (AGC-21) process. A second Qatar project undergoing a feasibility study calls for a 20,0000-barrel-per-day plant to be developed by Sasol (South Africa) and Phillips Petroleum (USA) with Qatar General Petroleum. It will use Sasol's Slurry Phased Distillate GTL process technology to produce naphtha and distillate. A U.S.-based effort to develop more advanced GTL technology is the DOE joint venture with Air Product and Chemicals, an 8-year project funded with $84 million to develop GTL technology with lower associated costs. Statoil (Norway) and Sasol (South

Africa) have a joint venture to develop GTL for large-scale offshore production. While thermal efficiencies of current GTL applications are in the range of 60 to 65 percent, new technology is expected to improve them.

Domestically, the Alaskan North Slope is a potential area for application of GTL technology. This would involve transporting the produced liquids via the Trans-Alaska Pipeline System (TAPS) to tankers at the port of Valdez in south Alaska, which has favorable implications for the economics of TAPS operations over the longer term.

Converting Natural Gas into Other Products

Natural gas can be converted into other marketable products. Present techniques allow the production from natural gas of ammonia/urea, methanol, and methyl tertiary butyl ether (MTBE). Ammonia, a common industrial chemical, has its most important use in the production of urea, which is the principal building block of nitrogen fertilizers. Most new export-oriented plants integrate ammonia and urea manufacture. Expanded use of natural gas for this purpose is expected to be limited by fertilizer market growth and political differences between countries. Methanol is an industrial chemical feedstock and can be used as an alternative liquid transportation fuel. Recently, Norway's Statoil and Conoco Inc. dedicated a $1 billion natural gas-to-methanol plant at Tjeldbergodden, Norway, with capacity to meet 15 percent of Europe's annual methanol consumption.[33] Absent higher oil prices or legal requirements for alternative transportation fuels, the methanol market likely will remain a relatively small chemical-oriented market, rather than a large fuel-oriented market. MTBE can be blended with gasoline to produce reformulated gasoline. It also is used sometimes in lesser proportions as an "octane enhancer" in unleaded "conventional" gasoline. However, even a very large expansion of MTBE markets would not entail very large increases in natural gas usage.

International and Deepwater Pipeline Construction Is Advancing

Another intriguing alternative to LNG is the building of natural gas pipelines in deep water or through difficult terrain that has previously been considered too difficult or too costly.

International Pipelines

Gas pipelines are probably the least expensive and most effective means of moving bulk energy over long distances. International pipeline projects hold the promise of moving natural gas from places where it is plentiful (e.g., the Persian Gulf) to places where it is scarce (e.g., the Indian subcontinent). However, there are preconditions to successful implementation of an international pipeline project, which can be difficult to achieve:

- First, the governments along the route must be seen to be sufficiently stable (and have sufficient guarantees for private contracts) to make commitments that will be binding upon successor governments.
- Universal agreement must be reached among pipeline operators, consumers, intermediary states (if any), and resource owners on the distribution of costs and benefits from the project. Unreasonable behavior on the part of any party will prevent the project from going forward.
- There must be a large downstream gas market. As in the case of LNG projects, long-distance pipeline projects require large volumes to be economical. The U.S.-Canadian border is criss-crossed with pipelines. Europe has also developed an effective international gas transmission system. In South America, political and economic reform has had the side-effect of also making international pipeline projects possible. On the other hand, a large-diameter pipeline running from Iran to Pakistan and on to India, while feasible technically and economically, at present is highly unlikely for political reasons. There are many other potential projects affected by similar circumstances.

Deepwater Pipelines

Pipelines have been successfully laid under the ocean and through mountains, swamps, tundra, and permafrost. The construction of large-diameter pipelines across the Mediterranean, connecting Algeria with Spain and Italy, has had a significant dampening effect on trans-Mediterranean LNG markets. The development of similar projects in Asia may have a similar effect. In recent years, the Oman Oil Company (mostly owned by the government of the Sultanate of Oman) has proposed a pioneering deepwater pipeline to connect Oman and India. This project is clearly an alternative to a Middle East-India LNG project, and it bypasses the technically easy but politically difficult problem of building an onshore or shallow-water pipeline via Iran and Pakistan. However, it has never been made clear who would be able to build the deepwater pipeline, nor how much it would cost. In the future, if the technical and economic hurdles can be overcome, there are many situations where deepwater pipelines could be effective competitors to future LNG projects.

Gas Hydrate Deposits Are a Potential Natural Gas Supply Source Close to Large Gas Markets

Immense amounts of methane, the principal constituent of natural gas, naturally occur in gas hydrate deposits located in oceanic sediments and in sediments underlying the Arctic permafrost zone. These deposits constitute by far the largest potentially available source of methane on Earth. Worldwide, the amount of carbon bound in gas hydrates is conservatively estimated to be twice the amount that is believed to exist in all other fossil fuels on Earth. Global methane hydrate resource estimates made by various parties between 1977 and 1994 place the total methane volume resident in continental deposits in the range of 500 to 1,200,000 trillion cubic feet, and the volume resident in marine deposits in the range of 110,000 to 270,000,000 trillion cubic feet.

Massive concentrations of methane hydrate have been mapped in the relatively shallow continental shelf waters off the U.S. East Coast. Initial core drilling for scientific purposes was conducted last fall in a pair of hydrate-rich areas located off the coast of the Carolinas, each about the size of Rhode Island. These two areas are estimated by the United States Geological Survey to hold more than 1,300 trillion cubic feet of gas, which is about 60 times more than the total 1995 U.S. gas consumption of 21.6 trillion cubic feet. Hydrates also have been discovered off the coasts of California, Washington, and Alaska.

Other nations with indigenous or near offshore methane hydrate deposits have significant hydrate research efforts. Japan has a $50 million program in place, and plans to demonstrate methane hydrate production from the Nankai Trough off the East Coast of Honshu by 1999. Norway also has a methane hydrate research program, since there are large deposits in the North Sea. A potentially important offshoot application that Norway has already bench tested is marine shipment of natural gas in hydrate form, which is safer than shipping LNG and appears to be approximately as economic when scaled up.

The only place where commercial production of methane hydrate is currently taking place, although not by design, is in the Messoyakha Gas Field located in Western Siberia, Russia. The serial pressure decline and production data for this field provide a strong indication that an increasing portion of the gas production originates in a methane hydrate layer located 700 meters beneath the surface and 100 meters thick. In 1990 the gas from this layer comprised nearly half of total field production.

Considerable research is needed to characterize more accurately the geology of methane hydrate deposits, leading to the development of means to extract them safely and efficiently and the eventual conversion of this resource into an abundant, commercially viable source of relatively clean energy.

Summary: LNG Trade Through 2015 Is Expected To Show Large Increases But Later Technology Developments and Gas Hydrates Could Curb Further Expansion

The outlook for both supply and demand for LNG looks strong for the period through 2015. Growing demand in the Asian markets, with an emphasis on the environmental advantages of natural gas as a relatively clean burning fuel, will be an important factor in that growth. Expansions of existing facilities and the construction of new facilities to accommodate the expected increases are either underway or in the planning stages. Global proved reserves of natural gas are plentiful, equaling approximately 60 years at current global production levels, and global natural gas resources are larger still.

The processing and transport of LNG, however, is a costly process. The development of competing technologies, such as gas-to-liquids, can alter the economics and the outlook for LNG beyond 2015. Two significant unknowns that can have an immense effect on the longer-term outlook include any agreements relating to caps on carbon emissions—which could substantially increase the need for natural gas—and secondly, gas hydrates, a huge potential resource that is not yet well understood. The close location of gas hydrates to some of the major markets for LNG could dampen growth in the LNG market, as would the rapid growth of nuclear power, which would provide another clean-air alternative for generating power.

Endnotes

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2. British Petroleum Company, *BP Statistical Review of World Energy 1997* (London, UK, June 1997), web site 165.121.20.76/bpstats.

3. Proved reserves are the estimated quantities that analysis of geological and engineering data demonstrate with reasonable certainty to be recoverable in future years from known reservoirs under existing economic and operating conditions. However, significant reserves in the probable category are included in "reserves" estimates for various countries, including those of the former Soviet Union.

4. British Petroleum Company, *BP Statistical Review of World Energy 1996* (London, UK, June 1996).

5. U.S. number is from the Energy Information Administration, *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves, Annual Report 1995* (DOE/EIA-0216(95) (Washington, DC, November 1996; the Canadian number is from the Canadian Association of Petroleum Producers.

6. A.D. Koen and W.R. True, "World's Developing Regions Provide Spark for Pipeline Construction," *Oil and Gas Journal*, Vol. 94, No. 6 (February 5, 1996), pp. 29-31.

7. Enron Corporation, *The 1995 Enron Outlook* (Houston, TX, 1995), p. 22.

8. British Petroleum Company, *BP Statistical Review of World Energy 1996* (London, UK, June 1996), pp. 26, 28, web site 165.121.20.76/bpstats.

9. All U.S. LNG exports (from Cook Inlet, Alaska) went to Japan in 1995.

10. V. Thomas, "LNG Shifts Course for New Markets," *Financial Times International Gas Report*, No. 321, p. 33.

11. British Petroleum Company, *BP Statistical Review of World Energy* (London, UK, June 1996), p. 28, web site 165.121.20.76/bpstats.

12. "Korea Weighs Import Alternatives to Feed Demand," *World Gas Intelligence*, Vol. 8, No. 6 (March 28, 1997), p. 9.

13. WEFA Group," *Far East Report 1995*, p. 9.3.

14. "Korea Weighs Import Alternatives to Feed Demand," *World Gas Intelligence*, Vol. 8, No. 6 (March 28, 1997), p. 9.

15. "Reluctant Thailand Finally Ready for Plunge into LNG," *World Gas Intelligence*, Vol. 8, No. 5 (March 14, 1997), p. 1.

16. "India Calls for LNG," *Alexander's Gas & Oil Connections: News and Trends*, web site www.gasandoil.com (December 8, 1996).

17. "China/LNG: Shanghai Seeks LNG Funds," *Financial Times International Gas Report*, No. 320 (April 4, 1997), p. 29.

18. British Petroleum Company, *BP Statistical Review of World Energy 1996* (London, UK, June 1996), p. 28, web site 165.121.20.76/bpstats.

19. V. Thomas, "LNG Shifts Course for New Markets," *Financial Times International Gas Report*, No. 321 (April 18, 1997), p. 33.

20. M.A. Adelman and M. Lynch, "Natural Gas Supply in the Asia-Pacific Basin," in Massachusetts Institute of Technology Center for Energy Policy Research, *East Asia/Pacific Natural Gas Trade: Final Report*, 86-006 (Cambridge, MA, March 1986).

21. *Petroleum Economist* in conjunction with Citibank, "Liquefaction Plants in the World: Extensions and New Projects," in *LNG—Evolution and Development* (London, UK, 1996).

22. The project needs sufficient gas to supply it for 15 to 20 years, with a terminal reserves-to-production ratio of 10 to 15, to ensure that the full contract amount can be produced at the end of the contract period. Arithmetically, if annual deliverability is 500 million cubic feet per day (0.1825 trillion cubic feet per year), then the amount needed is 25 to 35 x 0.1825 = 4.56 to 6.39 trillion cubic feet. If one accounts for "shrinkage" from extraction of natural gas liquids and nonhydrocarbon gases, as well as liquefaction plant and tanker fuel use, "wet gas" reserves need to be perhaps 20 percent larger than "dry gas" reserves, or 4.56 to 6.39 x 1.2 = 5.48 to 7.67 trillion cubic feet.

23. See table in T. Toichi, "LNG Development at a Turning Point and Policy Issues for Japan," *Energy in Japan*, No. 126 (March 1994). A U.S. Department of Energy study estimated capital costs for a liquefaction plant, gas pretreatment, storage, and marine facilities at $1.7 to $2.1 billion 1987 dollars (depending on the availability of existing infrastructure) for a nominal 6.4-million-metric-ton-per-year plant, or $264 to $325 million per million metric tons of capacity. See: U.S. Department of Energy, Office of Policy, Planning, and Analysis, *Assessment of Costs and Benefits of Flexible and Alternative Fuel Use in the U.S. Transportation Sector: Technical Report Three: Methanol Production and Transportation Costs* (Washington, DC, November 1989), p. 33.

24. M.A. Adelman and M. Lynch, "Natural Gas Supply in the Asia-Pacific Basin," in Massachusetts Institute of Technology Center for Energy Policy Research, *East Asia/Pacific Natural Gas Trade: Final Report*, 86-006 (Cambridge, MA, March 1986).

25. M.A. Adelman and M. Lynch, "Natural Gas Supply in the Asia-Pacific Basin," in Massachusetts Institute of Technology Center for Energy Policy Research, *East Asia/Pacific Natural Gas Trade: Final Report*, 86-006 (Cambridge, MA, March 1986).

26. For instance, a recent account in the trade press of negotiations between Korean buyers and Omani sellers indicated that the Omanis were seeking a floor price of $2.25 per million Btu, with the LNG normally sold at 90 percent of the average cost of LNG imported into Japan. Japanese LNG import prices are, in turn, linked to crude oil import prices. "Oman LNG Finally Locks Up a Stubborn South Korea," *World Gas Intelligence* (March 15, 1996), p. 1.

27. "Asian LNG Prices," *World Gas Intelligence* (January 15, 1997), p. 10.

28. V. Thomas, "LNG Shifts Course for New Markets," *Financial Times International Gas Report*, No. 321 (April 18, 1997), p. 33.

29. "Qatargas to sell to Europe," *Financial Times International Gas Report*, No. 320 (April 4, 1997), p. 26.

30. C. Lyons, "Gas Deal Up for Re-negotiation," *Seatrade World Review Monthly* (July 1994), p. 25.

31. T. Toichi, "LNG Development at a Turning Point and Policy Issues for Japan," *Energy in Japan*, No. 126 (March 1994).

32. In this report, GTL refers to the conversion of the gas itself into another product. LNG describes the conversion of natural gas into shippable liquids by altering its state.

33. "Statoil, Conoco Dedicate Giant Norwegian Methanol Plant," *Oil and Gas Journal*, Vol. 95, No. 28 (July 14, 1997), p. 26.

U.S. Natural Gas Imports and Exports—1996

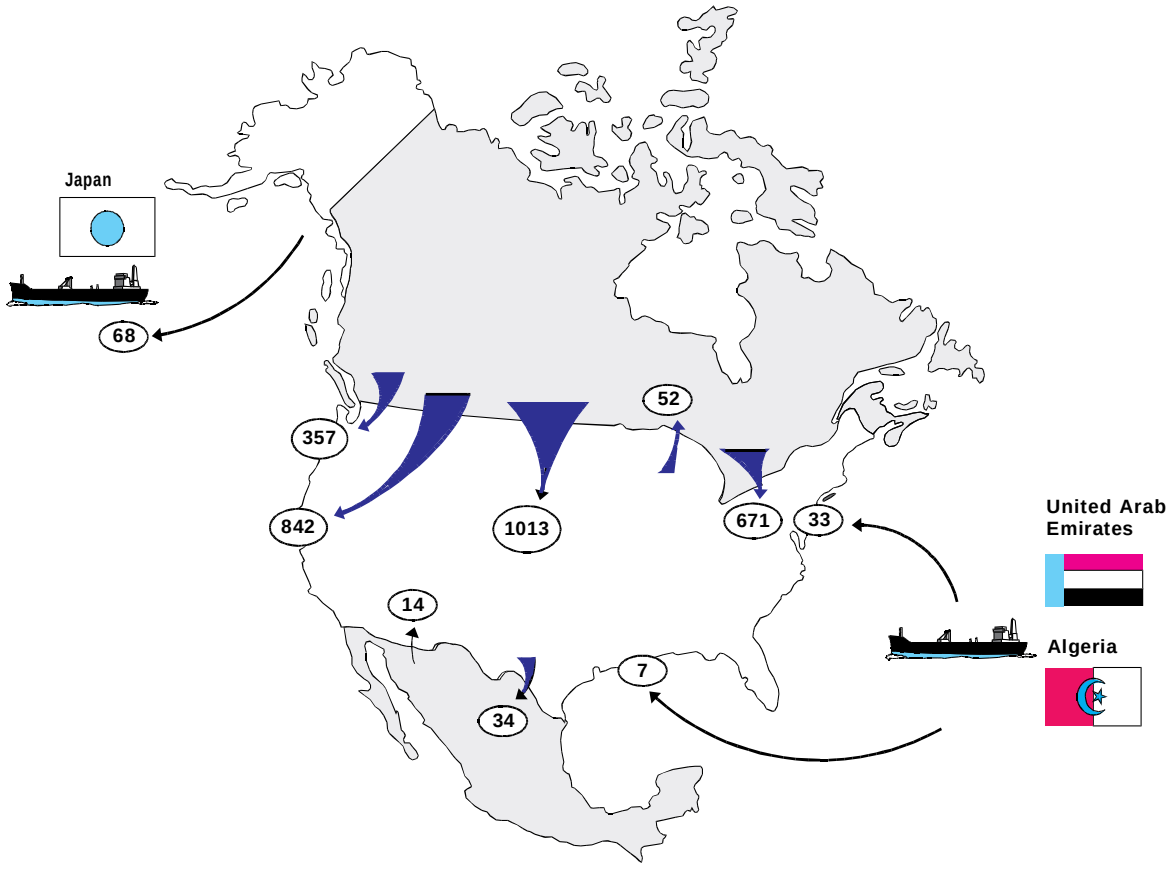
by Ann M. Ducca and Norman L. Crabtree

During 1996, Canada continued its role as the major supplier of gas imported into the United States. However, the growth rate of U.S. imports of Canadian gas slowed as pipeline capacity utilization remained near its maximum level and capacity expansion grew only minimally. Mexico continued to become increasingly integrated into the North American natural gas market as cooperative projects among the North American nations proceeded. Spot purchases of liquefied natural gas (LNG) from the United Arab Emirates indicated that LNG transactions are becoming more flexible and responsive to changes in the world marketplace (Figure SR1).

Some of the highlights of 1996 for U.S. natural gas imports and exports are:

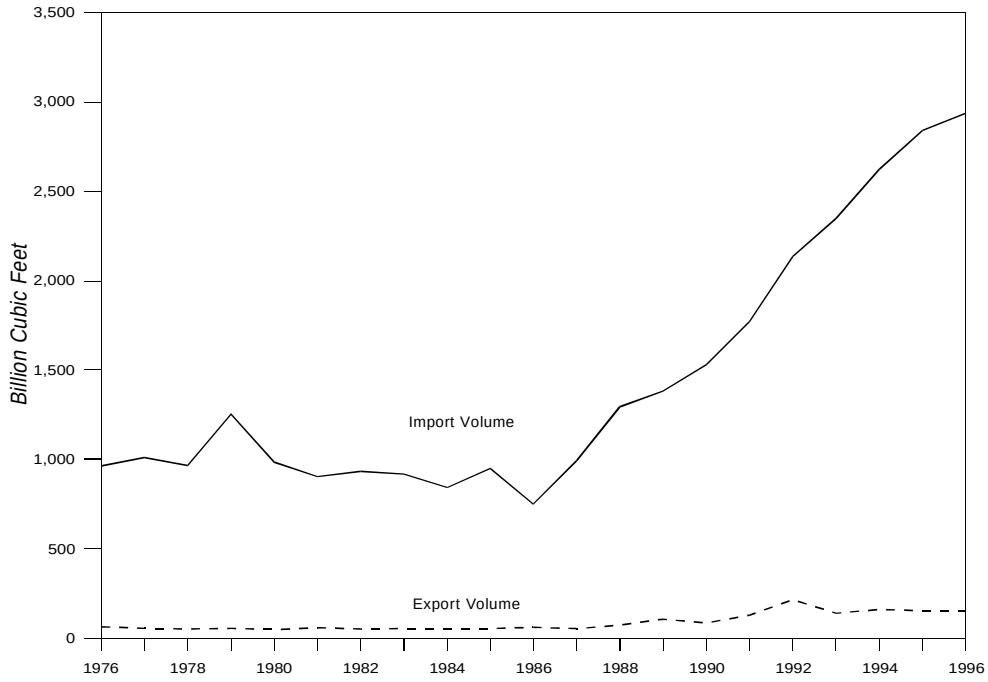
- Net imports rose for the 10th consecutive year, representing almost 13 percent of U.S. natural gas consumption. Exports remained at nearly the same level as one year ago (Table SR1).

Figure SR1. Flow of Natural Gas Imports and Exports, 1996
(Billion Cubic Feet)



Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Figure SR2. Total Natural Gas Imports and Exports, 1976-1996



Sources: 1994 and Earlier Years: Energy Information Administration, Form FPC-14,"Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

- Pipeline imports from Canada continued to climb to a new record level of 2,883 billion cubic feet, although the growth rate slowed. From 1995 to 1996 imports rose in all regional areas, with the Northeast and the Pacific Northwest showing the largest volumetric increases.

- The annual average price of natural gas imports from Canada rebounded to $1.96 per thousand cubic feet, 32 percent above last year's 20-year record low of $1.48 per thousand cubic feet (Table SR2). The substantial increase in Canadian gas prices follows the upward trend in U.S. wellhead prices.

- LNG imports from Algeria reached 35.3 billion cubic feet, almost double their 1995 level. This dramatic increase was primarily the result of the end of curtailments which began in August 1994 because of a major renovation project on Algeria's liquefaction plants.

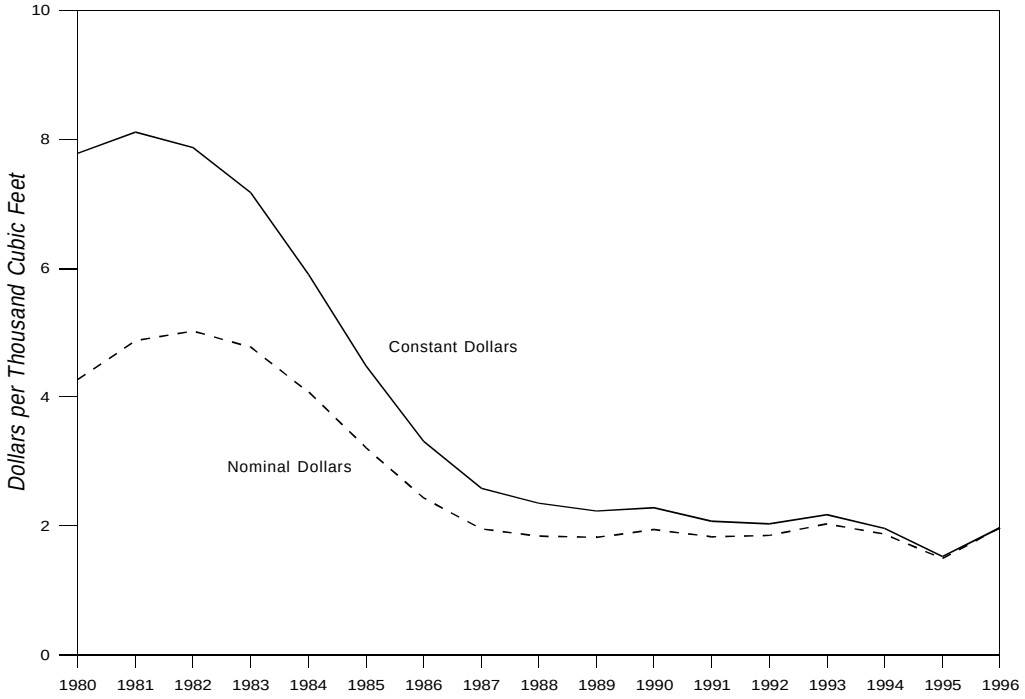
- LNG exports from Alaska to Japan rose by 4 percent from 1995 levels to a record 67.6 billion cubic feet. These exports are nearing the maximum level of authorized volumes.

Trade with Canada

For the 10th consecutive year, natural gas imports from Canada increased, with record levels achieved in each of the past 9 years. (Figure SR2). They reached 2,883 billion cubic feet in 1996, accounting for 98 percent of net U.S. imports of natural gas. Net imports continued to represent a growing share of U.S. natural gas consumption—approaching 13 percent in 1996 (Figure SR5).

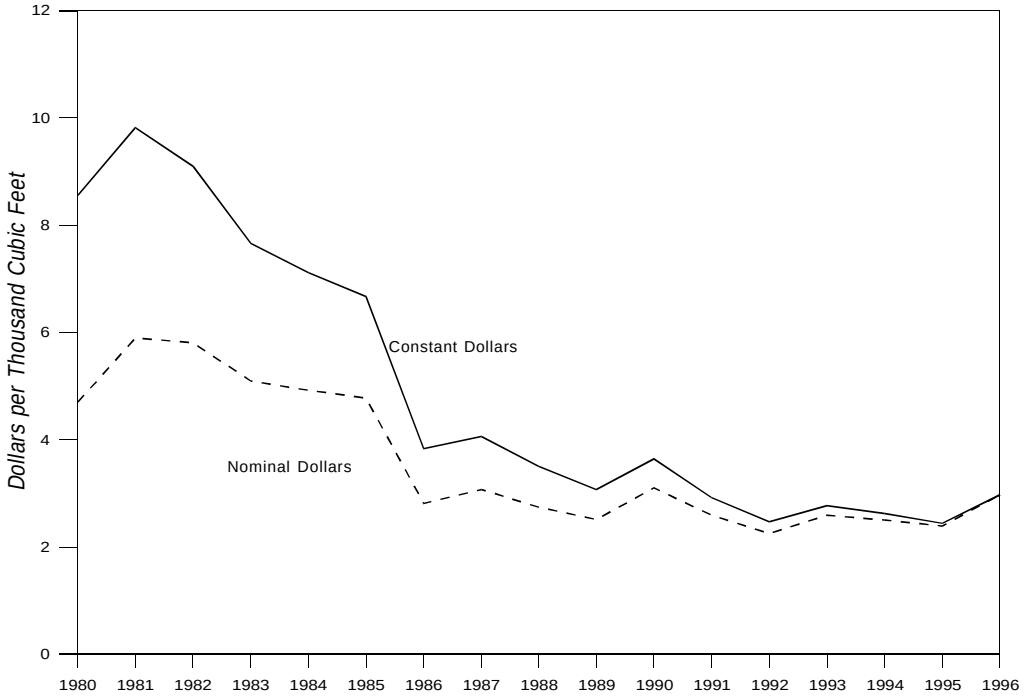
Despite the record import levels from Canada, the growth rate slowed to 2.4 percent in contrast to an average annual growth rate of 12 percent during the previous 9 years. The capacity of the pipelines that bring the gas across the border constrained the growth rate. Although a substantial increase in Canadian export capacity has taken place during the past 5 years, thus enabling the high growth rates experienced, current capacity is almost completely utilized. The current capacity oper-

Figure SR3. Average Price of U.S. Natural Gas Imports, 1980-1996



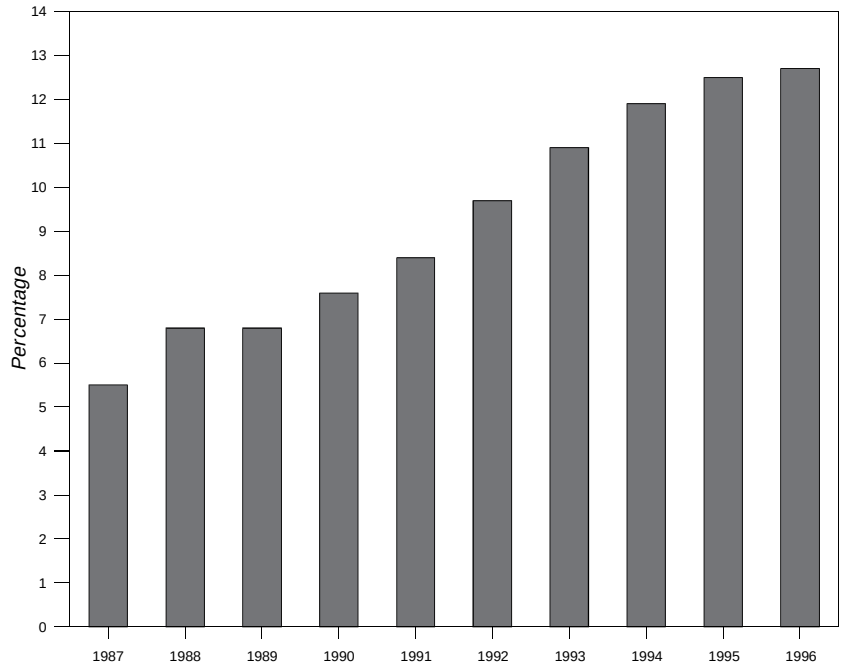
Sources: Nominal Dollars: 1994 and Earlier Years: Energy Information Administration, Form FPC-14,"Annual Report for Importers and Exporters of Natural Gas."' 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*
Constant Dollars: Prices were converted to 1996 dollars using the chain-type price indexes for Gross Domestic Product (1992 = 1.0) as published by the U.S. Department of Commerce, Bureau of Economic Analysis.

Figure SR4. Average Price of U.S. Natural Gas Exports, 1980-1996



Sources: Nominal Dollars: 1994 and Earlier Years: Energy Information Administration, Form FPC-14,"Annual Report for Importers and Exporters of Natural Gas."' 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*
Constant Dollars: Prices were converted to 1996 dollars using the chain-type price indexes for Gross Domestic Product (1992 = 1.0) as published by the U.S. Department of Commerce, Bureau of Economic Analysis.

Figure SR5. Net Imports as a Percentage of Total Consumption, 1987-1996



Sources: 1994 and Earlier Years: Energy Information Administration, Form FPC-14,"Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

ated in excess of a 90 percent load factor during 1996.[1] The greatest monthly import volume of the year occurred during December, when the capacity utilization reached up to 98 percent.

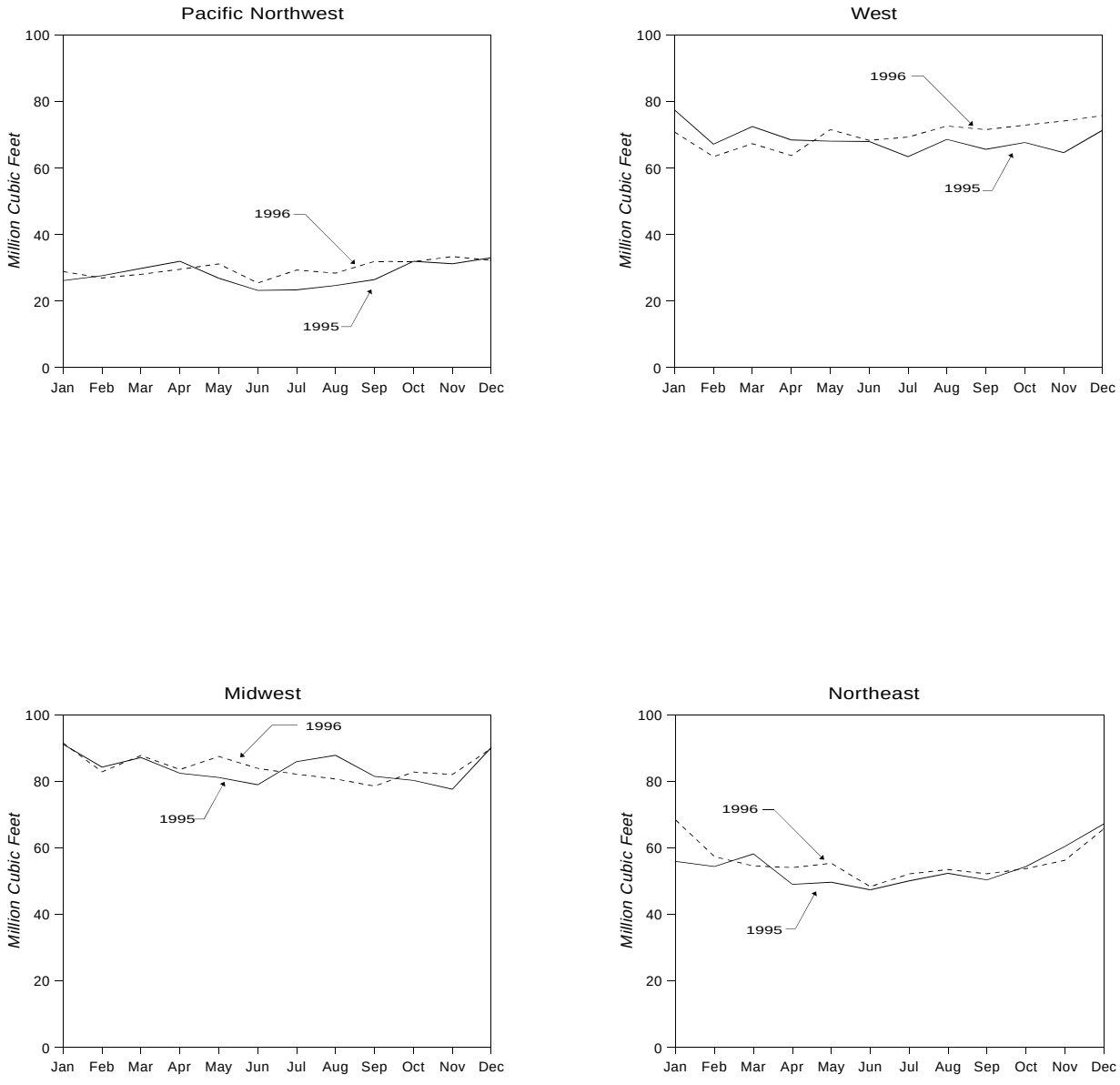
Capacity expansion slowed in 1996 with less than a 1-percent increase. However, a number of pipeline projects are underway that would add substantial export capacity from Canada into the U.S. Midwest and Northeast. These projects will increase capacity by up to 5 billion cubic feet per day, although most are not expected to become operational until 2000. An additional 4 billion cubic feet per day of capacity additions is proposed for moving gas from the Midwest to the Northeast. This greater capacity within the United States will facilitate marketing of both Canadian and domestic gas in major consuming markets.

The average price of natural gas imports from Canada rebounded to $1.96 per thousand cubic feet, a 32-percent increase over last year's 20-year record low of $1.48 per thousand cubic feet. This is the second-highest average price since 1986 after the $2.02 average price of 1993 (Table SR7). The substantial increase in Canadian import prices follows the trend in the U.S. wellhead prices, which rose 45 percent from 1995 to 1996. (The 1995 and 1996 wellhead prices per thousand cubic feet were $1.55 and $2.24, respectively. See Table 4 in the *Natural Gas Monthly* for wellhead prices.)

Pipeline imports from Canada enter the United States in four regional areas: the Pacific Northwest, the West, the Midwest, and the Northeast. From 1995 to 1996, natural gas imports rose in all four regional areas with the largest volumetric increases occurring in the Northeast (22.6 billion cubic feet) and the Pacific Northwest (20.8 billion cubic feet). The price of Canadian gas imports also rose in all four regions with increases ranging from 16 percent to 42 percent (Table SR6 and Figures SR6 and SR7).

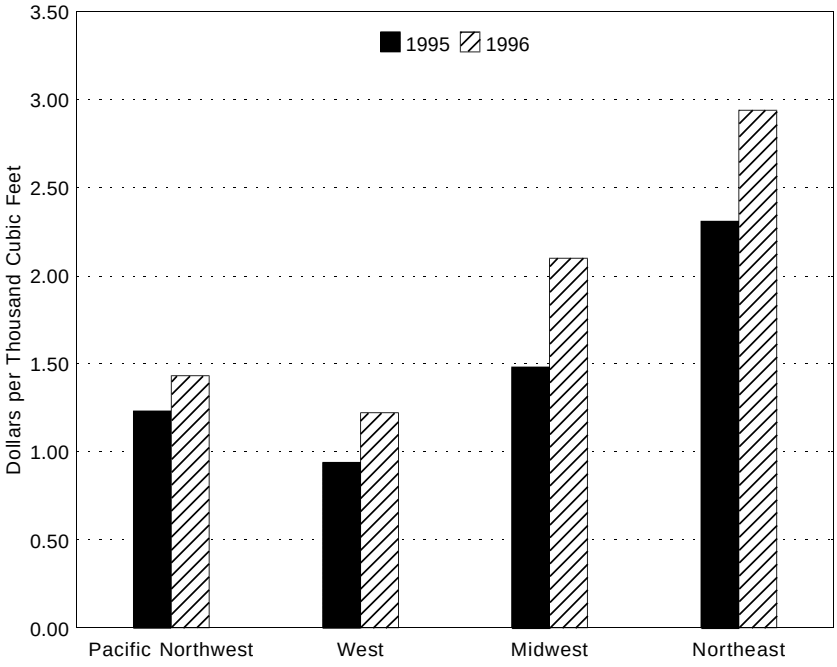
1 Natural Resources Canada, *Canadian Natural Gas: Review of 1996 & outlook to 2002*, (Ottawa, Canada, April 1997).

Figure SR6. U.S. Natural Gas Pipeline Imports from Canada by Regional Point of Entry, 1995-1996



Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Figure SR7. Average Price of U.S. Natural Gas Pipeline Imports from Canada by Regional Point of Entry, 1995-1996



Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

The Pacific Northwest, which has the lowest load factor relative to capacity, recorded the highest percentage increase in import volumes, 6.2 percent above last year's level. Canadian gas imports into this region reached 357 billion cubic feet in 1996. There is a single entry point at Sumas, Washington, , t a total of five pipelines cross the border. Three of these lines are user-dedicated (to U.S. customers) and have built-in excess capacity, but this excess cannot be used to move gas to other customers. Thus this region is fast approaching export capacity limits, as are the other three regions. The Pacific Northwest experienced the lowest increase in price, from $1.23 per thousand cubic feet in 1995 to $1.43 in 1996, a 16-percent increase.

The West region also has only one entry point, located at Eastport, Idaho, and had the second-highest import volume in 1996 (the Midwest had the highest) at 842 billion cubic feet, a 2.3 percent increase over 1995. Almost all of these imports are marketed in California. The West had the lowest regional price in 1996, $1.22 per thousand cubic feet, yet this price was nearly 30 percent higher than the 1995 price.

The Midwest region received the greatest volume of imports—1,013 billion cubic feet in 1996, less than 1 percent higher than the 1995 level. The entry points are located in Michigan, Minnesota, Montana, and North Dakota. The sharpest price increase occurred in this region, with the average price climbing from $1.48 to $2.10 per thousand cubic feet, a 42-percent increase.

Northeast imports rose by 3.5 percent to 671.3 billion cubic feet. Imports enter the Northeast through New York and Vermont. Imports at Grand Island and Champlain in New York, which were cited as showing the highest growth rates of all entry points in 1995, both experienced import reductions in 1996. The Champlain decrease was less than 4 percent, while the Grand Island drop was 15 percent, mainly because of a decline in short-term import sales and the termination of a long-term import contract by a New York distribution company. The Massena, New York import point also experienced a volume decrease of 23 percent, mostly as a result of a cogeneration facility reducing its

take under a long-term supply arrangement. The Northeast paid the highest regional price, $2.94 per thousand cubic feet. This was 27 percent higher than the 1995 price in the region and more than double the price paid in the West.

Natural gas exports to Canada climbed sharply to 52 billion cubic feet, an 88-percent increase over 1995 levels, but represented a return to 1994 levels. The average price of these exports was $2.67 per thousand cubic feet—a 36-percent increase over the 1995 price (Table SR3). Despite the low prices for U.S. gas exports in 1995, Canadian gas was still more competitively priced. By 1996 the price of U.S. gas exports was closer to the Canadian price, which may have contributed to the increase in exports from the United States into Canada. Exports to Canada represented 34 percent of total U.S. natural gas exports during 1996.

Trade With Mexico

Exports of natural gas to Mexico fell sharply in 1996 to 33.8 billion cubic feet, the lowest level since 1990 and 45 percent less than the 1995 level. The price of exports to Mexico rebounded to $2.11 per thousand cubic feet, up 41 percent from 1995 and the highest price since 1989. An explosion in July 1996 at one of Mexico's largest gas-processing plants destroyed a third of that nation's total processing capacity, and exports to Mexico surged during the following month (Tables SR8 and SR9). However, production capacity has returned to 95 percent of pre-explosion levels.[2]

The United States imported 13.9 billion cubic feet of natural gas from Mexico in 1996, more than double the amount imported during 1995. From 1984 through November 1993, the United States did not import gas from Mexico. Trade resumed in December 1993, and in each year since that time imports from Mexico have represented less than 1 percent of total U.S. natural gas imports (Table SR4). The evolving bilateral trade between the United States and Mexico is expected to continue. Crossborder trade reflects the circumstances of gas demand in various locations and the proximity of available infrastructure or gas supplies on either side of the border.

Several projects are proceeding that will more fully integrate Mexico into the North American natural gas system. In a cooperative move among the North American nations, a consortium led by TransCanada Pipeline won the right in March 1997 to build a natural gas pipeline in the Yucatan peninsula. Other participants in the project, known as Merida, are the Bechtel affiliate, International Generating Company, and the Mexican firm, Corporacion GUTSA. The primary customers for this pipeline will be power plants in southern Mexico.[3] In addition, other privately financed power generation and gas distribution projects are proceeding. Some of these include plans to import gas from the United States. Providing underlying support for many such projects is Mexico's intention to shift electricity generation from oil to natural gas.[4]

Liquefied Natural Gas

During 1996, the United States imported liquefied natural gas (LNG) from Algeria and the United Arab Emirates (Abu Dhabi) into Massachusetts and Louisiana and exported LNG from Alaska to Japan. LNG imports represented 1 percent of total imports, while LNG exports were 44 percent of total exports. Liquefaction makes overseas transportation possible. A 600-to-1 volume reduction is achieved by lowering the temperature of natural gas to approximately minus 260 degrees Fahrenheit.

LNG imports from Algeria rose to 35.3 billion cubic feet in 1996, nearly double the 1995 level. This dramatic increase was primarily the result of the end of curtailments, which began in August 1994. Sonatrach, the state-owned oil and gas company in Algeria, curtailed exports because of a major renovation project on that nation's liquefaction plants. Those renovations have progressed so that the original capacities of its liquefaction plants have been restored. Shipments at reduced levels were received during the first half of 1996,

2 "Pemex Sees Sufficient Gas for Domestic Needs," *Platt's Oilgram News*, (June 5, 1997), p. 3.

3 "TransCanada Gets Pact to Build Mexico Trunkline*" Platt's Oilgram News* (March 21, 1997), p. 3.

4 "Industry Optimism on Upswing Over Gas Projects in Mexico" *Natural Gas Week* (April 14, 1997), p. 1.

but by the final quarter, shipments returned to pre-curtailment levels. LNG shipments from Algeria into the United States may also rise as a result of the beginning of operations (in November 1996) on the Gazoduc Maghreb-Europe pipeline. This pipeline provides an alternative way to deliver natural gas to Spain, which has been Algeria's second-largest (France is the largest) LNG customer. The result of using this pipeline for shipments to Spain would be that more LNG export capacity from Algeria will become available.

For the first time since 1986 when LNG was imported from Indonesia, and for only the second time since LNG imports commenced, spot purchases of LNG were received from sources other than Algeria. LNG was imported into Everett, Massachusetts from the United Arab Emirates in September and December of 1996; these shipments totaled just under 5 billion cubic feet. Another first occurred during the first half of 1997—a spot purchase of LNG from Australia was received in May, also in Massachusetts. These spot purchases indicate that LNG transactions are becoming more flexible and responsive to changes in the world marketplace. The Special Focus article, "Worldwide Natural Gas Supply and Demand and the Outlook for Global LNG Trade," which also appears in this issue of the *Natural Gas Monthly*, discusses the potential of LNG trading across the world.

Another factor influencing the increase in LNG imports was the significant rise in the prices of U.S. natural gas supplies. This enabled the historically higher-priced LNG to compete more successfully in the northeastern markets. The price of LNG imports from Algeria rose 17 percent to $2.70 per thousand cubic feet. The price for the shipments from the United Arab Emirates averaged $3.46 per thousand cubic feet, bringing the averages LNG import price to $2.80 per thousand cubic feet.

LNG exports from Alaska to Japan rose 4 percent from 1995 to 1996 to a record 67.6 billion cubic feet (Table SR5). The price for these exports increased 7 percent from the previous year to $3.65 per thousand cubic feet. Total LNG exports to Japan are nearing the maximum level of volumes authorized by the U.S. Department of Energy, Office of Fossil Energy.

At present, there are two LNG import facilities in the United States that are not receiving LNG shipments. The Cove Point LNG facility in southern Maryland continues to be used to liquefy and store gas for later regasification during peak demand periods. For the present, the facility uses domestic gas, but in the long term it expects to be a receiving terminal for LNG tankers. The Elba Island LNG facility in Georgia is not scheduled for operation through 2000.

There are currently five projects proposed to expand U.S.-International LNG Trade:

- The Ecoelectrica Power Plant in Puerto Rico. This project would build a power plant to be fueled by LNG imported from various sources. The earliest possible in-service date is late 1997.

- The Trinidad and Tobago Export Facility. This project would develop the natural gas resources off the east coast of Trinidad and construct an LNG facility to export the gas to the Northeast United States and Europe. The earliest possible in-service date is mid-1999.

- The Nigerian LNG Export Project. This project would construct a new gas liquefaction facility off the Nigerian coast to export gas primarily to Europe but also to the United States. The earliest possible in-service date is late 2000.

- The Yukon Pacific LNG Export Project. This project would construct a new natural gas pipeline parallel to the existing crude oil pipeline in Alaska and a gas liquefaction plant and marine terminal at Valdez. The LNG would be exported from Alaska to Japan and other Pacific Rim countries. Completion of this project is anticipated for 2005 or later.

- The Cristobal Colon LNG Export Project. This project would develop natural gas resources off the eastern coast of Venezuela and build an LNG facility to ship to Western Europe and possibly the United States. The project is currently on hold.

Summary

Despite record import levels from Canada during 1996, the growth rate slowed as pipeline capacity utilization remained near its maximum level and capacity expansion grew only minimally. The near-term outlook is for further growth in imports because a number of pipeline projects are underway that would add substantial export capacity from Canada into the U.S. Midwest and Northeast. However, most of these projects are not expected to become operational until 2000. Trade between the United States and Mexico continued to evolve. It is influenced by the circumstances of gas demand in various locations and the proximity of available infrastructure or gas supplies on either side of the border. With the significant rise in U.S. natural gas prices, LNG imports (representing 1 percent of total U.S. gas imports) competed successfully in Northeast markets. Spot purchases of LNG from the United Arab Emirates indicated that LNG transactions are becoming more flexible and responsive to changes in the world marketplace.

Data Sources

Data for 1995 and 1996 are based on company filings made with the U.S. Department of Energy, Office of Fossil Energy. These filings report data on a monthly level and are received quarterly. The Office of Fossil Energy collects these data as part of its regulatory oversight responsibilities. These data are published by the Office of Fossil Energy in the quarterly report, *Natural Gas Imports and Exports* (DOE/FE-0347).

The data for 1994 and earlier years are taken from Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." The Form FPC-14 was discontinued in 1995. The data reported on Form FPC-14 represented physical movements of natural gas. The data collected by the Office of Fossil Energy are reported on an equity (sales) basis. For 1994 and earlier years, comparisons of the information in this article (physical movements) with the information reported by the Office of Fossil Energy (sales) may show differences because reporting requirements were different. Efforts were made to resolve these differences. Further information about how import and export data are collected is provided in the *Natural Gas Monthly*, Appendix B, "Data Sources."

Table SR1. Historical Summary of U.S. Natural Gas Net Imports, 1955-1996
(Million Cubic Feet)

Year	Total Imports	Total Exports	Net Imports	Total Consumption	Net Imports as Percentage of Total Consumption
1955	10,888	31,029	-	8,693,657	-
1956	10,380	35,963	-	9,288,865	-
1957	37,941	41,655	-	9,846,139	-
1958	135,797	38,719	97,078	10,302,608	0.9
1959	133,990	18,413	115,577	11,321,181	1.0
1960	155,646	11,332	144,314	11,966,537	1.2
1961	218,860	10,747	208,113	12,489,268	1.7
1962	401,534	15,814	385,720	13,266,513	2.9
1963	406,204	16,957	389,247	13,970,229	2.8
1964	443,326	19,603	423,723	14,813,808	2.9
1965	456,394	26,132	430,262	15,279,716	2.8
1966	479,780	24,639	455,141	16,452,403	2.8
1967	564,226	81,614	482,612	17,388,360	2.8
1968	651,885	93,745	558,140	18,632,062	3.0
1969	726,951	51,304	675,647	20,056,240	3.4
1970	820,780	69,813	750,967	21,139,386	3.6
1971	934,548	80,212	854,336	21,793,454	3.9
1972	1,019,496	78,013	941,483	22,101,452	4.3
1973	1,032,901	77,169	955,732	22,049,363	4.3
1974	959,284	76,789	882,495	21,223,133	4.2
1975	953,008	72,675	880,333	19,537,593	4.5
1976	963,768	64,711	899,057	19,946,496	4.5
1977	1,011,002	55,626	955,376	19,520,581	4.9
1978	965,545	52,532	913,013	19,627,478	4.7
1979	1,253,383	55,673	1,197,710	20,240,761	5.9
1980	984,767	48,731	936,036	19,877,293	4.7
1981	903,949	59,372	844,577	19,403,858	4.4
1982	933,336	51,728	881,608	18,001,055	4.9
1983	918,407	54,639	863,768	16,834,914	5.1
1984	843,060	54,753	788,307	17,950,524	4.4
1985	949,715	55,268	894,447	17,280,943	5.2
1986	750,449	61,271	689,178	16,221,296	4.2
1987	992,532	54,020	938,512	17,210,809	5.5
1988	1,293,812	73,638	1,220,174	18,029,588	6.8
1989	1,381,520	106,871	1,274,648	18,800,830	6.8
1990	1,532,259	85,565	1,446,694	18,716,269	7.6
1991	1,773,313	129,244	1,644,068	19,035,156	8.4
1992	2,137,504	216,282	1,921,222	19,544,364	9.7
1993	2,350,115	140,183	2,209,931	20,279,095	10.9
1994	2,623,839	161,738	2,462,101	20,707,717	11.9
1995	2,841,048	154,119	2,686,929	21,580,665	12.5
1996	2,937,413	153,393	2,784,020	[a] 21,929,370	12.7

[a] Preliminary data.
- = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: **Total Consumption:** *Natural Gas Annual 1990 Volume 2* for 1955 through 1988; *Natural Gas Monthly* July 1995 for 1989 and 1990, August 1997 for 1991 through 1996. **All Other Data:** 1955-1971: Federal Power Commission, informally collected by letter. 1972-1994: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR2. Summary of U.S. Natural Gas Imports, 1995-1996

Source	Volume (million cubic feet)		Percent Change	Average Btu/ Cubic Foot		Revenue (thousand dollars)		Average Price (dollars/ thousand cubic feet)		Percent Change	Average Price (dollars/ million Btu)		Percent Change
	1995	1996		1995	1996	1995	1996	1995	1996		1995	1996	
Pipeline													
Canada	2,816,408	2,883,277	2.4	1,021	1,021	4,176,377	5,645,578	1.48	1.96	32.4	1.45	1.92	32.4
Mexico	6,722	13,862	106.2	1,013	1,013	10,289	31,236	1.53	2.25	47.1	1.51	2.22	47.0
Total	2,823,130	2,897,138	2.6	1,021	1,021	4,186,667	5,676,814	1.48	1.96	32.4	1.45	1.92	32.4
LNG													
Algeria	17,918	35,325	97.1	1,098	1,100	41,144	95,522	2.30	2.70	17.4	2.09	2.46	17.7
Un. Arab Emirates		4,949			1,115		17,102		3.46			3.10	
Grand Total	2,841,048	2,937,413	3.4	1,021	1,022	4,227,811	5,789,438	1.49	1.97	32.2	1.46	1.93	32.2

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR3. Summary of U.S. Natural Gas Exports, 1995-1996

Source	Volume (million cubic feet)		Percent Change	Average Btu/ Cubic Foot		Cost (thousand dollars)		Average Price (dollars/ thousand cubic feet)		Percent Change	Average Price (dollars/ million Btu)		Percent Change
	1995	1996		1995	1996	1995	1996	1995	1996		1995	1996	
Pipeline													
Canada	27,554	51,905	88.4	1,013	1,013	54,042	138,345	1.96	2.67	36.2	1.94	2.63	35.6
Mexico	61,283	33,840	-44.8	1,011	1,011	91,653	71,369	1.50	2.11	40.7	1.48	2.09	41.2
Total	88,836	85,745	-3.5	1,012	1,012	145,694	209,714	1.64	2.45	49.4	1.62	2.42	49.4
LNG													
Japan	65,283	67,648	3.6	1,010	1,010	222,930	246,589	3.41	3.65	7.0	3.38	3.61	6.8
Grand Total	154,119	153,393	-0.5	1,011	1,011	368,624	456,303	2.39	2.97	24.3	2.37	2.94	24.1

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR4. Historical Summary of U.S. Natural Gas Imports, 1955-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year	Imports from Canada		Imports from Mexico Pipeline	Imports from Algeria LNG	Imports from Others LNG	Total Imports[a]	Average Price
	Pipeline	LNG					
1955	10,881	0	7	0	0	10,888	NA
1956	10,374	0	6	0	0	10,380	NA
1957	20,971	0	16,970	0	0	37,941	NA
1958	89,586	0	46,211	0	0	135,797	NA
1959	83,061	0	50,929	0	0	133,990	NA
1960	108,657	0	46,989	0	0	155,646	NA
1961	167,104	0	51,756	0	0	218,860	NA
1962	350,438	0	51,096	0	0	401,534	NA
1963	356,455	0	49,749	0	0	406,204	NA
1964	390,721	0	52,605	0	0	443,326	NA
1965	404,686	0	51,708	0	0	456,394	NA
1966	430,189	0	49,591	0	0	479,780	NA
1967	513,255	0	50,971	0	0	564,226	NA
1968	604,462	0	47,423	NA	0	651,885	NA
1969	680,106	0	46,845	NA	0	726,951	NA
1970	778,687	NA	41,336	757	0	820,780	NA
1971	910,926	1,500	20,689	1,433	0	934,548	NA
1972	1,009,093	230	8,140	2,032	0	1,019,496	0.31
1973	1,027,216	667	1,632	3,388	0	1,032,901	0.35
1974	959,063	0	222	0	0	959,284	0.55
1975	948,115	0	0	4,893	0	953,008	1.21
1976	953,613	0	0	10,155	0	963,768	1.72
1977	996,723	572	2,384	11,324	0	1,011,002	1.98
1978	881,123	0	0	84,422	0	965,545	2.13
1979	1,000,775	0	0	252,608	0	1,253,383	2.49
1980	796,507	0	102,410	85,850	0	984,767	4.28
1981	762,107	6	105,013	36,824	0	903,949	4.88
1982	783,407	0	94,794	55,136	0	933,336	5.03
1983	711,923	0	75,361	131,124	0	918,407	4.78
1984	755,368	0	51,502	36,191	0	843,060	4.08
1985	926,056	0	0	23,659	0	949,715	3.21
1986	748,780	0	0	0	[b] 1,669	750,449	2.43
1987	992,532	0	0	0	0	992,532	1.95
1988	1,276,322	0	0	17,490	0	1,293,812	1.84
1989	1,339,357	0	0	42,163	0	1,381,520	1.82
1990	1,448,065	0	0	84,193	0	1,532,259	1.94
1991	1,709,716	0	0	63,596	0	1,773,313	1.83
1992	2,094,387	0	0	43,116	0	2,137,504	1.85
1993	2,266,751	0	1,678	81,685	0	2,350,115	2.03
1994	2,566,049	0	7,013	50,778	0	2,623,839	1.87
1995	2,816,408	0	6,722	17,918	0	2,841,048	1.49
1996	2,883,277	0	13,862	35,325	[c] 4,949	2,937,413	1.97

[a] Volumes reported for 1966 through 1996 are on a pressure base of 14.73 pounds per square inch absolute and 60 degrees Fahrenheit. Volumes for 1955 through 1965 are as reported.
[b] Received from Indonesia.
[c] Received from United Arab Emirates.
NA = Not available.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: 1955-1971: Federal Power Commission, informally collected by letter. 1972-1994: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR5. Historical Summary of U.S. Natural Gas Exports, 1955-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year	Exports to Canada Pipeline	Exports to Mexico Pipeline	Exports to Japan LNG	Total Exports[a]	Average Price
1955	11,467	19,562	0	31,029	NA
1956	16,819	19,144	0	35,963	NA
1957	30,867	10,788	0	41,655	NA
1958	32,129	6,590	0	38,719	NA
1959	11,739	6,674	0	18,413	NA
1960	5,759	5,573	0	11,332	NA
1961	5,577	5,170	0	10,747	NA
1962	5,574	10,240	0	15,814	NA
1963	6,879	10,078	0	16,957	NA
1964	9,763	9,840	0	19,603	NA
1965	17,979	8,153	0	26,132	NA
1966	20,281	4,358	0	24,639	NA
1967	70,456	11,158	0	81,614	NA
1968	81,647	12,098	0	93,745	NA
1969	34,931	13,391	2,982	51,304	NA
1970	10,878	14,678	44,257	69,813	NA
1971	14,349	15,632	50,231	80,212	NA
1972	15,553	14,579	47,882	78,013	0.51
1973	14,824	13,999	48,346	77,169	0.54
1974	13,263	13,268	50,258	76,789	0.72
1975	10,219	9,454	53,002	72,675	1.25
1976	7,506	7,425	49,779	64,711	1.55
1977	31	3,940	51,655	55,626	1.92
1978	66	4,033	48,434	52,532	2.13
1979	76	4,308	51,289	55,673	2.29
1980	113	3,886	44,732	48,731	4.70
1981	106	3,337	55,929	59,372	5.90
1982	162	1,705	49,861	51,728	5.81
1983	136	1,646	52,857	54,639	5.10
1984	127	1,786	52,840	54,753	4.92
1985	178	2,207	52,883	55,268	4.77
1986	9,203	1,896	50,172	61,271	2.81
1987	3,297	2,125	48,599	54,020	3.07
1988	19,738	2,327	51,573	73,638	2.74
1989	38,443	17,004	51,424	106,871	2.51
1990	17,359	15,659	52,546	85,565	3.10
1991	14,791	60,448	54,005	129,244	2.59
1992	67,777	95,973	52,532	216,282	2.25
1993	44,518	39,676	55,989	140,183	2.59
1994	52,556	46,500	62,682	161,738	2.50
1995	27,554	61,283	65,283	154,119	2.39
1996	51,905	33,840	67,648	153,393	2.97

[a] Volumes reported for 1966 through 1996 are on a pressure base of 14.73 pounds per square inch absolute and 60 degrees Fahrenheit. Volumes for 1955 through 1965 are as reported.

NA = Not available.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: 1955-1971: Federal Power Commission, informally collected by letter. 1972-1994: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)							
	Pacific Northwest		West		Midwest			
	Sumas, WA		Eastport, ID		Babb, MT		Detroit, MI	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995								
January	26,116	1.55	77,522	1.12	940	1.49	1,238	2.41
February	27,604	1.39	67,201	0.92	859	1.37	1,120	2.09
March	29,771	1.24	72,514	0.88	1,502	1.22	1,149	2.13
April	31,919	1.13	68,477	0.85	1,449	1.22	1,028	1.82
May	26,820	1.16	68,123	0.95	884	1.27	1,049	1.98
June	23,164	1.19	68,015	0.95	824	1.19	1,124	2.01
July	23,334	1.14	63,468	0.88	834	1.21	1,047	1.83
August	24,640	1.08	68,658	0.81	1,503	1.14	828	1.82
September	26,418	1.15	65,655	0.88	719	1.35	1,009	1.85
October	31,914	1.15	67,733	0.96	668	1.33	1,010	1.98
November	31,166	1.30	64,660	1.01	1,397	1.09	1,258	2.04
December	33,000	1.30	71,451	1.08	1,496	1.10	1,377	2.36
Total	335,866	1.23	823,478	0.94	13,075	1.23	13,236	2.05
1996								
January	28,846	1.32	70,890	1.14	1,717	1.13	1,094	2.99
February	26,907	1.30	63,462	1.13	1,787	1.15	1,017	2.69
March	27,998	1.20	67,378	1.07	1,515	1.13	822	2.65
April	29,522	1.02	63,802	0.97	862	1.16	1,170	2.78
May	31,119	1.02	71,599	0.96	1,149	1.14	1,374	2.54
June	25,397	1.03	68,369	0.96	2,301	1.00	1,254	2.65
July	29,278	1.14	69,350	1.06	594	1.09	1,448	2.92
August	28,358	1.19	72,691	1.17	485	1.13	1,218	2.91
September	31,892	1.12	71,589	1.09	777	1.11	1,349	2.38
October	31,846	1.24	72,952	1.15	1,055	1.08	1,010	2.53
November	33,330	2.14	74,184	1.60	1,847	1.22	1,779	2.86
December	32,217	3.16	75,849	2.20	2,458	1.40	1,366	3.05
Total	356,711	1.43	842,114	1.22	16,545	1.16	14,901	2.75

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)							
	Midwest							
	Harve, MT		International Falls, MN		Marysville, MI		Noyes , MN	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995								
January	0	-	581	2.18	0	-	35,891	1.85
February	0	-	574	2.05	0	-	35,956	1.65
March	0	-	582	2.02	0	-	34,991	1.66
April	0	-	524	2.18	0	-	32,382	1.74
May	0	-	411	2.53	0	-	31,754	1.82
June	0	-	399	2.56	0	-	31,896	1.87
July	1,362	0.81	419	2.28	0	-	33,088	1.72
August	1,526	0.76	378	2.31	0	-	33,108	1.66
September	69	0.79	378	2.43	0	-	33,375	1.76
October	0	-	464	2.21	0	-	29,500	1.81
November	0	-	527	1.51	0	-	33,138	1.87
December	0	-	503	1.62	0	-	35,105	2.16
Total	2,958	0.78	5,740	2.13	0	-	400,184	1.80
1996								
January	0	-	545	1.83	0	-	35,962	2.64
February	0	-	495	1.83	10	3.48	32,842	2.29
March	0	-	559	1.78	0	-	34,892	2.48
April	0	-	521	1.69	0	-	31,383	2.44
May	0	-	514	1.51	0	-	34,559	2.16
June	0	-	478	1.44	0	-	32,217	2.23
July	0	-	494	1.46	0	-	32,636	2.38
August	0	-	496	1.50	0	-	30,988	2.23
September	0	-	479	1.48	0	-	30,558	1.93
October	0	-	479	1.55	0	-	31,733	1.95
November	0	-	647	1.79	0	-	31,863	2.56
December	0	-	666	2.37	0	-	34,782	3.33
Total	0	-	6,373	1.71	10	3.48	394,415	2.40

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)									
	Midwest									
	Port of Del Bonita, MT		Port of Morgan, MT		Portal, ND		St Clair, MI		Warroad, MN	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995										
January	6	1.39	48,554	1.28	197	1.21	2,979	1.55	83	2.36
February	7	1.39	41,670	1.10	155	0.95	3,138	1.72	79	2.38
March	12	1.39	47,127	1.03	191	0.93	854	1.85	61	2.51
April	10	1.39	46,130	1.10	212	0.95	64	1.64	190	2.24
May	8	1.39	46,032	1.17	363	1.04	28	1.71	168	2.34
June	3	1.39	43,571	1.16	290	1.03	316	1.70	152	2.44
July	3	1.39	45,537	1.09	593	0.92	2,547	1.66	13	4.66
August	0	-	47,776	1.07	571	0.77	1,710	1.46	13	4.80
September	0	-	44,368	1.23	517	0.86	200	1.59	21	3.67
October	0	-	47,052	1.32	498	0.87	0	-	26	2.77
November	8	1.39	39,832	1.41	574	1.12	180	2.15	68	1.41
December	8	1.39	49,319	1.72	399	1.17	1,224	2.91	85	1.75
Total	65	1.39	546,969	1.23	4,559	0.97	13,239	1.76	959	2.34
1996										
January	7	1.05	49,129	1.83	313	1.18	2,015	3.66	147	2.51
February	5	1.05	45,015	1.72	292	1.07	660	4.22	142	2.03
March	7	1.06	48,752	1.79	312	1.07	191	5.05	76	1.98
April	7	1.04	46,255	1.97	521	1.02	2,204	2.93	50	2.15
May	7	1.04	47,947	1.75	535	1.00	793	2.34	32	1.63
June	3	1.04	45,901	1.75	606	1.00	583	2.59	5	1.67
July	7	1.02	45,262	1.85	657	1.11	475	2.60	14	1.99
August	6	1.02	44,888	1.82	630	1.13	1,471	2.43	14	1.72
September	6	1.02	42,447	1.44	609	1.12	1,795	2.11	17	1.21
October	6	1.05	45,761	1.60	630	1.16	1,504	2.54	32	1.21
November	6	1.05	44,399	2.25	494	1.77	378	3.35	73	1.87
December	5	1.05	47,318	3.10	512	2.60	2,064	4.04	83	2.96
Total	72	1.04	553,073	1.91	6,110	1.27	14,132	3.04	685	2.14

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)									
	Midwest				Northeast					
	Whitlash, MT		Total		Champlain, NY		Grand Island, NY		Highgate Springs, VT	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995										
January	643	1.41	91,111	1.54	1,468	3.14	3,470	2.30	972	2.30
February	681	1.35	84,239	1.38	1,317	3.15	3,582	2.24	982	2.13
March	678	1.42	87,146	1.32	1,463	3.14	4,561	2.04	805	2.18
April	431	1.45	82,420	1.38	1,268	3.15	3,061	2.27	662	2.22
May	455	1.46	81,152	1.45	1,418	3.15	2,944	2.37	394	3.08
June	407	1.45	78,982	1.47	1,453	3.15	3,639	2.31	290	3.73
July	452	1.45	85,896	1.36	1,427	3.15	4,302	2.09	275	3.95
August	392	1.45	87,806	1.31	1,461	3.15	4,250	2.01	277	3.86
September	825	1.22	81,480	1.46	1,424	3.15	4,106	2.17	298	3.58
October	1,049	1.24	80,269	1.51	1,452	3.15	4,069	2.22	442	3.23
November	642	1.44	77,622	1.61	1,157	3.27	5,858	2.29	820	2.14
December	675	1.43	90,191	1.90	1,422	3.27	6,777	2.62	1,201	1.98
Total	7,330	1.38	1,008,314	1.48	16,728	3.17	50,619	2.26	7,417	2.51
1996										
January	616	1.14	91,544	2.18	1,454	3.26	6,875	3.59	1,181	2.74
February	569	1.25	82,835	1.96	1,377	3.27	6,347	3.50	1,050	2.38
March	625	1.21	87,753	2.06	1,459	3.26	3,134	3.29	981	2.63
April	578	1.11	83,550	2.16	1,337	3.26	2,988	3.13	583	3.28
May	556	1.01	87,465	1.91	1,372	3.27	3,180	2.82	426	3.55
June	542	0.93	83,889	1.92	1,317	3.27	2,092	2.96	283	3.75
July	557	0.93	82,143	2.07	1,378	3.27	2,317	3.08	232	4.78
August	504	0.99	80,700	1.99	1,387	3.28	2,236	2.94	272	3.83
September	520	0.98	78,557	1.65	1,330	3.27	2,097	2.82	309	3.24
October	553	1.02	82,761	1.75	1,305	3.25	2,122	2.74	655	2.52
November	565	1.21	82,050	2.35	953	3.39	3,385	3.32	840	2.59
December	636	1.71	89,889	3.15	1,435	3.40	6,058	4.11	898	3.07
Total	6,820	1.14	1,013,137	2.10	16,104	3.29	42,832	3.35	7,711	2.92

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)							
	Northeast							
	Massena, NY		Niagara Falls, NY		North Troy, VT		Waddington, NY	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995								
January	1,783	2.97	23,392	2.32	979	2.42	23,853	2.29
February	2,029	2.52	22,259	2.24	951	2.45	23,241	2.20
March	1,810	2.55	23,146	2.20	990	2.36	25,373	2.15
April	1,463	2.51	20,261	2.24	871	2.58	21,342	2.12
May	1,234	2.86	19,876	2.34	932	2.58	22,791	2.18
June	1,305	2.83	18,793	2.33	657	3.06	21,158	2.24
July	1,115	2.90	21,099	2.25	903	2.45	20,834	2.14
August	1,097	2.88	22,016	2.15	946	2.47	22,268	2.04
September	1,201	2.80	20,946	2.22	928	2.53	21,381	2.11
October	1,279	2.68	23,545	2.24	962	2.50	22,619	2.18
November	1,596	2.65	25,453	2.38	931	2.60	24,595	2.35
December	1,809	2.63	29,142	2.66	962	2.81	25,873	2.65
Total	17,720	2.71	269,928	2.31	11,012	2.55	275,326	2.23
1996								
January	1,759	2.94	29,448	3.23	958	2.96	26,701	3.24
February	1,594	3.06	22,481	3.02	902	3.22	23,591	3.15
March	1,663	3.03	22,065	2.97	964	2.97	24,272	3.15
April	1,251	2.84	25,053	2.85	932	2.98	21,911	2.89
May	703	3.25	25,583	2.63	957	2.74	23,117	2.72
June	792	2.91	20,824	2.64	927	2.74	21,984	2.70
July	824	2.84	22,394	2.86	952	2.83	24,040	2.75
August	794	2.92	23,700	2.71	792	2.73	24,268	2.57
September	838	2.85	23,587	2.59	789	2.92	23,217	2.33
October	962	2.63	24,056	2.59	955	3.01	23,679	2.43
November	1,200	2.78	24,042	2.94	933	3.28	24,876	3.10
December	1,262	2.92	27,959	3.54	964	3.60	27,151	3.75
Total	13,642	2.92	291,193	2.90	11,024	3.00	288,807	2.92

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)				Mexico (Pipeline)					
	Northeast		Total		Texas				Total	
	Total				Hidalgo, TX		Penitas, TX			
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995										
January	55,917	2.35	250,666	1.59	0	-	158	1.38	158	1.38
February	54,360	2.26	233,404	1.45	0	-	0	-	0	-
March	58,147	2.20	247,578	1.39	150	1.50	0	-	150	1.50
April	48,929	2.23	231,745	1.37	0	-	0	-	0	-
May	49,588	2.31	225,682	1.45	0	-	0	-	0	-
June	47,295	2.34	217,456	1.47	0	-	0	-	0	-
July	49,955	2.24	222,652	1.40	0	-	0	-	0	-
August	52,314	2.15	233,419	1.33	824	1.53	0	-	824	1.53
September	50,284	2.22	223,836	1.43	3,872	1.53	0	-	3,872	1.53
October	54,368	2.26	234,284	1.48	1,095	1.57	623	1.54	1,718	1.56
November	60,408	2.38	233,857	1.60	0	-	0	-	0	-
December	67,185	2.65	261,828	1.79	0	-	0	-	0	-
Total	648,750	2.31	2,816,408	1.48	5,941	1.53	781	1.51	6,722	1.53
1996										
January	68,376	3.25	259,656	2.08	1,499	2.03	0	-	1,499	2.03
February	57,342	3.12	230,546	1.94	698	2.14	0	-	698	2.14
March	54,539	3.07	237,668	1.91	1,259	2.34	0	-	1,259	2.34
April	54,054	2.90	230,928	1.86	1,369	2.18	0	-	1,369	2.18
May	55,339	2.71	245,522	1.70	4,024	2.14	0	-	4,024	2.14
June	48,220	2.71	225,875	1.70	711	2.35	0	-	711	2.35
July	52,137	2.84	232,908	1.82	1,313	2.58	0	-	1,313	2.58
August	53,450	2.68	235,199	1.80	30	1.70	0	-	30	1.70
September	52,168	2.51	234,206	1.60	517	1.67	253	1.72	770	1.69
October	53,734	2.55	241,294	1.68	1,110	2.37	0	-	1,110	2.37
November	56,230	3.04	245,795	2.25	982	2.85	0	-	982	2.85
December	65,727	3.66	263,681	3.00	96	3.30	0	-	96	3.30
Total	671,314	2.94	2,883,277	1.96	13,609	2.26	253	1.72	13,862	2.25

See footnotes at the end of table.

Table SR6. U.S. Natural Gas Imports by Point of Entry, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	LNG						Total	
	Everett, MA		Lake Charles, LA		Total			
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995								
January	2,511	2.40	0	-	2,511	2.40	253,335	1.60
February	0	-	2,573	1.81	2,573	1.81	235,977	1.46
March	2,621	2.45	0	-	2,621	2.45	250,349	1.40
April	0	-	0	-	0	-	231,745	1.37
May	0	-	2,576	1.89	2,576	1.89	228,259	1.46
June	0	-	0	-	0	-	217,456	1.47
July	0	-	0	-	0	-	222,652	1.40
August	2,648	2.42	0	-	2,648	2.42	236,891	1.34
September	0	-	0	-	0	-	227,708	1.43
October	0	-	0	-	0	-	236,003	1.48
November	2,487	2.47	0	-	2,487	2.47	236,344	1.61
December	2,502	2.65	0	-	2,502	2.65	264,329	1.80
Total	12,769	2.48	5,149	1.85	17,918	2.30	2,841,048	1.49
1996								
January	2,460	2.81	0	-	2,460	2.81	263,615	2.09
February	2,512	2.79	0	-	2,512	2.79	233,756	1.95
March	2,599	3.06	0	-	2,599	3.06	241,526	1.92
April	2,599	2.55	1,960	2.27	4,559	2.43	236,857	1.87
May	2,612	2.58	0	-	2,612	2.58	252,158	1.72
June	0	-	0	-	0	-	226,587	1.70
July	2,642	3.00	0	-	2,642	3.00	236,864	1.84
August	2,629	2.56	0	-	2,629	2.56	237,858	1.80
September	2,524	3.34	0	-	2,524	3.34	237,500	1.62
October	5,116	2.96	0	-	5,116	2.96	247,520	1.71
November	2,504	2.94	2,527	2.25	5,031	2.59	251,807	2.26
December	5,033	3.20	2,556	2.16	7,589	2.85	271,366	3.00
Total	33,232	2.92	7,042	2.22	40,274	2.80	2,937,413	1.97

- = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR7. Summary of U.S. Natural Gas Imports, 1977-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Pipeline				Total Pipeline	
	Canada		Mexico		Volume	Average Price
	Volume	Average Price	Volume	Average Price	,	
1977 Total	996,722	1.99	2,384	2.25	999,106	1.99
1978 Total	881,123	2.19	0	-	881,123	2.19
1979 Total	1,000,775	2.61	0	-	1,000,775	2.61
1980 Total	796,507	4.32	102,410	4.41	898,917	4.33
1981 Total	762,107	4.83	105,013	5.01	867,120	4.85
1982 Total	783,407	4.97	94,794	5.02	878,200	4.98
1983 Total	711,923	4.49	75,361	4.70	787,284	4.51
1984 Total	755,368	4.01	51,502	4.49	806,870	4.04
1985 Total	926,056	3.17	0	-	926,056	3.17
1986 Total	748,780	2.42	0	-	748,780	2.42
1987 Total	992,532	1.95	0	-	992,532	1.95
1988 Total	1,276,322	1.83	0	-	1,276,322	1.83
1989 Total	1,339,357	1.81	0	-	1,339,357	1.81
1990 Total	1,448,065	1.91	0	-	1,448,065	1.91
1991 Total	1,709,716	1.81	0	-	1,709,716	1.81
1992 Total	2,094,387	1.84	0	-	2,094,387	1.84
1993 Total	2,266,751	2.02	1,678	1.94	2,268,429	2.02
1994 Total	2,566,049	1.86	7,013	1.99	2,573,061	1.86
1995						
January	250,666	1.59	158	1.38	250,824	1.59
February	233,404	1.45	0	-	233,404	1.45
March	247,578	1.39	150	1.50	247,728	1.39
April	231,745	1.37	0	-	231,745	1.37
May	225,682	1.45	0	-	225,682	1.45
June	217,456	1.47	0	-	217,456	1.47
July	222,652	1.40	0	-	222,652	1.40
August	233,419	1.33	824	1.53	234,242	1.33
September	223,836	1.43	3,872	1.53	227,708	1.43
October	234,284	1.48	1,718	1.56	236,003	1.48
November	233,857	1.60	0	-	233,857	1.60
December	261,828	1.79	0	-	261,828	1.79
Total	2,816,408	1.48	6,722	1.53	2,823,130	1.48
1996						
January	259,656	2.08	1,499	2.03	261,155	2.08
February	230,546	1.94	698	2.14	231,244	1.94
March	237,668	1.91	1,259	2.34	238,927	1.91
April	230,928	1.86	1,369	2.18	232,297	1.86
May	245,522	1.70	4,024	2.14	249,546	1.71
June	225,875	1.70	711	2.35	226,587	1.70
July	232,908	1.82	1,313	2.58	234,221	1.83
August	235,199	1.80	30	1.70	235,229	1.80
September	234,206	1.60	770	1.69	234,976	1.60
October	241,294	1.68	1,110	2.37	242,403	1.68
November	245,795	2.25	982	2.85	246,776	2.25
December	263,681	3.00	96	3.30	263,777	3.00
Total	2,883,277	1.96	13,862	2.25	2,897,138	1.96

See footnotes at the end of table.

Table SR7. Summary of U.S. Natural Gas Imports, 1977-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	LNG						Grand Total	
	Algeria		Canada		Other		Volume	Average Price
	Volume	Average Price	Volume	Average Price	Volume	Average Price		
1977 Total	11,324	0.92	572	3.96	0	-	1,011,002	1.98
1978 Total	84,422	1.53	0	-	0	-	965,545	2.13
1979 Total	252,608	2.03	0	-	0	-	1,253,383	2.49
1980 Total	85,850	3.77	0	-	0	-	984,767	4.28
1981 Total	36,824	5.54	6	6.63	0	-	903,949	4.88
1982 Total	55,136	5.82	0	-	0	-	933,336	5.03
1983 Total	131,124	6.41	0	-	0	-	918,407	4.78
1984 Total	36,191	4.90	0	-	0	-	843,060	4.08
1985 Total	23,659	4.60	0	-	0	-	949,715	3.21
1986 Total	0	-	0	-	[a] 1,669	4.62	750,449	2.43
1987 Total	0	-	0	-	0	-	992,532	1.95
1988 Total	17,490	2.71	0	-	0	-	1,293,812	1.84
1989 Total	42,163	2.22	0	-	0	-	1,381,520	1.82
1990 Total	84,193	2.47	0	-	0	-	1,532,259	1.94
1991 Total	63,596	2.36	0	-	0	-	1,773,313	1.83
1992 Total	43,116	2.54	0	-	0	-	2,137,504	1.85
1993 Total	81,685	2.20	0	-	0	-	2,350,115	2.03
1994 Total	50,778	2.28	0	-	0	-	2,623,839	1.87
1995								
January	2,511	2.40	0	-	0	-	253,335	1.60
February	2,573	1.81	0	-	0	-	235,977	1.46
March	2,621	2.45	0	-	0	-	250,349	1.40
April	0	-	0	-	0	-	231,745	1.37
May	2,576	1.89	0	-	0	-	228,259	1.46
June	0	-	0	-	0	-	217,456	1.47
July	0	-	0	-	0	-	222,652	1.40
August	2,648	2.42	0	-	0	-	236,891	1.34
September	0	-	0	-	0	-	227,708	1.43
October	0	-	0	-	0	-	236,003	1.48
November	2,487	2.47	0	-	0	-	236,344	1.61
December	2,502	2.65	0	-	0	-	264,329	1.80
Total	17,918	2.30	0	-	0	-	2,841,048	1.49
1996								
January	2,460	2.81	0	-	0	-	263,615	2.09
February	2,512	2.79	0	-	0	-	233,756	1.95
March	2,599	3.06	0	-	0	-	241,526	1.92
April	4,559	2.43	0	-	0	-	236,857	1.87
May	2,612	2.58	0	-	0	-	252,158	1.72
June	0	-	0	-	0	-	226,587	1.70
July	2,642	3.00	0	-	0	-	236,864	1.84
August	2,629	2.56	0	-	0	-	237,858	1.80
September	0	-	0	-	[b] 2,524	3.34	237,500	1.62
October	5,116	2.96	0	-	0	-	247,520	1.71
November	5,031	2.59	0	-	0	-	251,807	2.26
December	5,164	2.51	0	-	[b] 2,425	3.57	271,366	3.00
Total	35,325	2.70	0	-	4,949	3.46	2,937,413	1.97

[a] Received from Indonesia.
[b] Received from United Arab Emirates.
- = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: 1994 and Earlier Years: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas". 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR8. U.S. Natural Gas Exports by Point of Exit, 1995-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)							
	Sumas, WA		Babb, MT		Detroit, MI		Marysville, MI	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995								
January	422	1.47	0	-	1,129	2.05	0	-
February	183	1.09	0	-	1,002	2.07	0	-
March	0	-	0	-	204	1.43	0	-
April	0	-	0	-	1,052	1.67	0	-
May	0	-	0	-	1,094	1.87	0	-
June	0	-	0	-	842	1.55	0	-
July	0	-	0	-	1,605	1.62	0	-
August	0	-	0	-	1,288	1.60	0	-
September	0	-	0	-	1,114	2.33	0	-
October	0	-	0	-	1,350	1.81	0	-
November	0	-	0	-	302	2.03	0	-
December	0	-	0	-	0	-	0	-
Total	605	1.36	0	-	10,980	1.83	0	-
1996								
January	373	1.70	0	-	1,299	3.03	354	3.17
February	79	1.60	0	-	2,776	2.32	234	2.79
March	0	-	0	-	4,046	2.51	0	-
April	0	-	0	-	2,085	2.12	0	-
May	0	-	0	-	2,634	2.11	50	2.45
June	0	-	0	-	2,155	2.10	0	-
July	0	-	0	-	2,296	2.20	0	-
August	0	-	0	-	1,850	2.21	0	-
September	0	-	0	-	2,284	1.86	0	-
October	0	-	0	-	3,549	1.85	0	-
November	239	3.63	63	1.46	2,804	2.50	0	-
December	760	3.23	27	1.70	2,631	3.71	0	-
Total	1,451	2.81	91	1.53	30,410	2.36	638	2.97

See footnotes at the end of table.

Table SR8. U.S. Natural Gas Exports by Point of Exit, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Canada (Pipeline)				Mexico (Pipeline)					
	St Clair, MI		Total		Douglas, AZ		Eagle Pass, TX		El Paso, TX	
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995										
January	967	2.15	2,518	2.00	0	-	0	-	1,511	1.63
February	831	2.17	2,016	2.02	0	-	0	-	1,272	1.32
March	2,183	1.97	2,387	1.92	0	-	0	-	1,551	1.31
April	1,405	1.96	2,457	1.84	0	-	0	-	1,219	1.42
May	837	2.19	1,931	2.01	0	-	0	-	1,182	1.46
June	1,264	2.15	2,106	1.91	0	-	0	-	2,166	1.51
July	842	2.19	2,446	1.82	0	-	0	-	2,095	1.33
August	1,270	1.94	2,558	1.77	0	-	0	-	1,365	1.31
September	2,222	1.88	3,336	2.03	0	-	0	-	1,142	1.48
October	1,579	1.99	2,929	1.91	0	-	0	-	1,211	1.51
November	1,325	2.25	1,627	2.21	0	-	0	-	1,176	1.59
December	1,244	2.43	1,244	2.43	42	1.53	0	-	1,168	1.80
Total	15,968	2.07	27,554	1.96	42	1.53	0	-	17,059	1.46
1996										
January	5,019	3.25	7,044	3.13	102	1.37	124	2.38	1,382	1.98
February	2,117	3.25	5,207	2.71	3	1.34	97	2.06	1,069	1.76
March	2,570	3.22	6,616	2.79	85	1.15	85	2.18	846	1.61
April	345	2.79	2,430	2.21	166	1.31	69	2.48	862	1.95
May	126	2.94	2,809	2.15	690	1.73	62	2.34	1,148	1.89
June	845	2.64	3,001	2.25	718	1.56	56	2.46	811	2.01
July	1,481	2.84	3,777	2.45	239	1.47	48	2.65	1,238	2.24
August	347	2.78	2,197	2.30	230	2.00	56	2.44	1,731	2.12
September	230	2.76	2,514	1.94	220	1.55	58	2.01	810	1.61
October	762	2.52	4,311	1.97	267	1.62	78	1.98	1,264	1.90
November	3,671	2.95	6,776	2.77	253	2.46	94	2.77	1,186	2.56
December	1,803	3.82	5,222	3.67	433	3.63	116	3.84	1,060	3.76
Total	19,315	3.13	51,905	2.67	3,405	1.92	942	2.52	13,406	2.14

See footnotes at the end of table.

Table SR8. U.S. Natural Gas Exports by Point of Exit, 1995-1996 (Continued)
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Mexico (Pipeline)						Japan (LNG)		Total	
	Hidalgo, TX		Penitas, TX		Total		Port Nikiski, AK			
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1995										
January	810	1.46	3,255	1.51	5,576	1.54	5,541	3.35	13,635	2.36
February	458	1.40	3,812	1.31	5,542	1.32	5,557	3.38	13,115	2.30
March	1,493	1.45	3,627	1.34	6,670	1.36	5,573	3.39	14,630	2.22
April	2,169	1.57	2,553	1.46	5,941	1.49	3,741	3.47	12,138	2.17
May	1,834	1.65	3,833	1.58	6,848	1.58	3,698	3.54	12,477	2.23
June	945	1.65	4,833	1.61	7,945	1.59	5,556	3.59	15,606	2.34
July	896	1.42	3,535	1.42	6,526	1.39	5,581	3.58	14,552	2.30
August	0	-	2,066	1.28	3,431	1.29	7,531	3.47	13,520	2.60
September	0	-	1,236	1.46	2,378	1.47	5,656	3.36	11,370	2.58
October	2,705	1.69	1,672	1.63	5,588	1.63	3,733	3.30	12,250	2.21
November	179	1.82	2,179	1.67	3,535	1.65	7,518	3.29	12,679	2.69
December	0	-	93	2.28	1,303	1.82	5,599	3.31	8,146	2.94
Total	11,488	1.58	32,694	1.48	61,283	1.50	65,283	3.41	154,119	2.39
1996										
January	0	-	0	-	1,607	1.98	5,534	3.38	14,186	3.10
February	0	-	831	1.89	2,000	1.82	5,621	3.35	12,828	2.85
March	0	-	1,845	1.91	2,860	1.81	5,642	3.55	15,118	2.88
April	827	1.44	0	-	1,924	1.69	5,654	3.57	10,008	2.88
May	0	-	0	-	1,899	1.84	3,750	3.61	8,458	2.73
June	1,242	2.44	660	2.43	3,486	2.16	5,651	3.65	12,138	2.87
July	666	2.39	870	2.30	3,062	2.24	7,546	3.66	14,385	3.04
August	3,719	2.13	3,440	2.10	9,176	2.11	5,663	3.67	17,036	2.65
September	457	1.92	844	1.78	2,389	1.73	5,663	3.73	10,566	2.85
October	380	1.79	0	-	1,990	1.85	5,589	3.84	11,889	2.83
November	0	-	0	-	1,533	2.56	5,670	4.01	13,979	3.25
December	305	3.63	0	-	1,914	3.72	5,665	3.73	12,801	3.70
Total	7,597	2.16	8,489	2.05	33,840	2.11	67,648	3.65	153,393	2.97

- = Not applicable.

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Table SR9. Summary of U.S. Natural Gas Exports, 1977-1996
(Volume in Million Cubic Feet; Average Price in Dollars per Thousand Cubic Feet)

Year and Month	Pipeline				Total Pipeline		LNG		Grand Total	
	Canada		Mexico		Volume	Average Price	Japan		Volume	Average Price
	Volume	Average Price	Volume	Average Price			Volume	Average Price		
1977 Total	31	1.54	3,940	1.41	3,971	1.41	51,655	1.96	55,626	1.92
1978 Total	66	1.79	4,003	1.65	4,098	1.66	48,434	2.17	52,532	2.13
1979 Total	76	2.04	4,308	1.97	4,384	1.97	51,289	2.32	55,673	2.29
1980 Total	113	3.31	3,886	2.47	3,999	2.50	44,732	4.90	48,731	4.70
1981 Total	106	4.79	3,337	3.37	3,443	3.41	55,929	6.05	59,372	5.90
1982 Total	162	4.95	1,705	5.17	1,867	5.15	49,861	5.83	51,728	5.81
1983 Total	136	4.60	1,646	4.79	1,782	4.78	52,857	5.11	54,639	5.10
1984 Total	127	4.19	1,786	4.48	1,913	4.46	52,840	4.93	54,753	4.83
1985 Total	178	3.06	2,207	3.99	2,385	3.92	52,883	4.81	55,268	4.77
1986 Total	9,203	2.12	1,896	3.49	11,099	2.35	50,172	2.91	61,271	2.81
1987 Total	3,297	1.81	2,125	3.18	5,421	2.35	48,599	3.15	54,020	3.07
1988 Total	19,738	2.02	2,327	3.21	22,065	2.14	51,573	2.99	73,638	2.74
1989 Total	38,443	2.00	17,004	2.14	55,447	2.05	51,424	3.01	106,871	2.51
1990 Total	17,359	2.70	15,659	1.88	33,018	2.31	52,546	3.59	85,565	3.10
1991 Total	14,791	1.91	60,448	1.76	75,239	1.79	54,005	3.71	129,244	2.59
1992 Total	67,777	1.83	95,973	1.90	163,750	1.88	52,532	3.43	216,282	2.25
1993 Total	44,518	2.14	39,676	2.02	84,195	2.08	55,989	3.34	140,183	2.59
1994 Total	52,556	2.42	46,500	1.68	99,057	2.08	62,682	3.18	161,738	2.50
1995										
January	2,518	2.00	5,576	1.54	8,094	1.68	5,541	3.35	13,635	2.36
February	2,016	2.02	5,542	1.32	7,558	1.51	5,557	3.38	13,115	2.30
March	2,387	1.92	6,670	1.36	9,057	1.51	5,573	3.39	14,630	2.22
April	2,457	1.84	5,941	1.49	8,397	1.59	3,741	3.47	12,138	2.17
May	1,931	2.01	6,848	1.58	8,779	1.67	3,698	3.54	12,477	2.23
June	2,106	1.91	7,945	1.59	10,051	1.66	5,556	3.59	15,606	2.34
July	2,446	1.82	6,526	1.39	8,972	1.51	5,581	3.58	14,552	2.30
August	2,558	1.77	3,431	1.29	5,989	1.49	7,531	3.47	13,520	2.60
September	3,336	2.03	2,378	1.47	5,714	1.80	5,656	3.36	11,370	2.58
October	2,929	1.91	5,588	1.63	8,517	1.73	3,733	3.30	12,250	2.21
November	1,627	2.21	3,535	1.65	5,161	1.82	7,518	3.29	12,679	2.69
December	1,244	2.43	1,303	1.82	2,547	2.12	5,599	3.31	8,146	2.94
Total	27,554	1.96	61,283	1.50	88,836	1.64	65,283	3.41	154,119	2.39
1996										
January	7,044	3.13	1,607	1.98	8,651	2.91	5,534	3.38	14,186	3.10
February	5,207	2.71	2,000	1.82	7,206	2.46	5,621	3.35	12,828	2.85
March	6,616	2.79	2,860	1.81	9,476	2.49	5,642	3.55	15,118	2.88
April	2,430	2.21	1,924	1.69	4,354	1.98	5,654	3.57	10,008	2.88
May	2,809	2.15	1,899	1.84	4,709	2.03	3,750	3.61	8,458	2.73
June	3,001	2.25	3,486	2.16	6,487	2.20	5,651	3.65	12,138	2.87
July	3,777	2.45	3,062	2.24	6,839	2.35	7,546	3.66	14,385	3.04
August	2,197	2.30	9,176	2.11	11,373	2.15	5,663	3.67	17,036	2.65
September	2,514	1.94	2,389	1.73	4,903	1.84	5,663	3.73	10,566	2.85
October	4,311	1.97	1,990	1.85	6,301	1.93	5,589	3.84	11,889	2.83
November	6,776	2.77	1,533	2.56	8,309	2.73	5,670	4.01	13,979	3.25
December	5,222	3.67	1,914	3.72	7,136	3.68	5,665	3.73	12,801	3.70
Total	51,905	2.67	33,840	2.11	85,745	2.45	67,648	3.65	153,393	2.97

Notes: Totals may not equal sum of components due to independent rounding. Geographic coverage is the continental United States including Alaska.

Source: 1994 and Earlier Years: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." 1995 and 1996: Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.*

Natural Gas Residential Pricing Developments During the 1996-97 Winter

William Trapmann and James Todaro

Many residential consumers were shocked by their high natural gas bills this past winter.[1] Monthly residential prices from November 1996 through March 1997 were between 10 and 19 percent higher than year-earlier levels (Figure FE1) despite a 4.1 percent decline in consumption. Overall, residential consumers paid $23.2 billion for natural gas during the 1996-97 heating season, compared with $21.1 billion in 1995-96—an increase of more than 10 percent.

Gas prices during the 1996-97 heating season were shaped to a considerable extent by the events of the prior winter. The 1995-96 heating season began with colder-than-normal temperatures over an extensive portion of the United States, including the heavy gas-consuming regions of the Midwest and Northeast. The resulting high levels of consumption were met with early drawdowns of storage gas. These storage volumes could not be replaced readily because the temperature pattern persisted, causing concern about future supply availability. By the end of the winter, storage levels had reached record lows.

When the 1996-97 heating season began with even more severe temperatures than in November 1995 and even lower storage inventories than the previous year, many distribution companies preferred to purchase gas on the spot market rather than draw down storage volumes early. This placed significant pressure on gas prices, which were already higher than last year in large part because of higher demands in mid-1996 to refill storage stocks. The average wellhead prices increased from $1.93 per thousand cubic feet (Mcf) in October 1996 to $3.53 in December 1996 and reached $3.69 in January 1997.The December 1996 price was almost double that of December 1995.

The higher prices have raised concerns about the performance of the industry. Individuals and organizations have questioned the capacity of the industry to deal with extreme conditions, and even the possibility of market abuses. Price levels reflect a complex set of influences, with storage operations being only one part of an extensive chain of services involved in producing, transporting, and distributing gas to consumers. The industry response to market conditions, pricing mechanisms, and the institutional and regulatory structure contributed to the developments of last winter. Some locations, such as New Mexico with residential price increases of almost 70 percent, were especially hard hit by circumstances that were specific to the particular State.

This article is intended to provide an understanding of the reasons behind the sharp rise in residential gas bills this past winter. It discusses the key factors that affect pricing patterns, highlighting the effects of weather, utilization patterns of natural gas storage, and pricing mechanisms used in natural gas markets. It also considers market power issues and some insights into the future that can be gained from the events of the 1996-97 heating season.

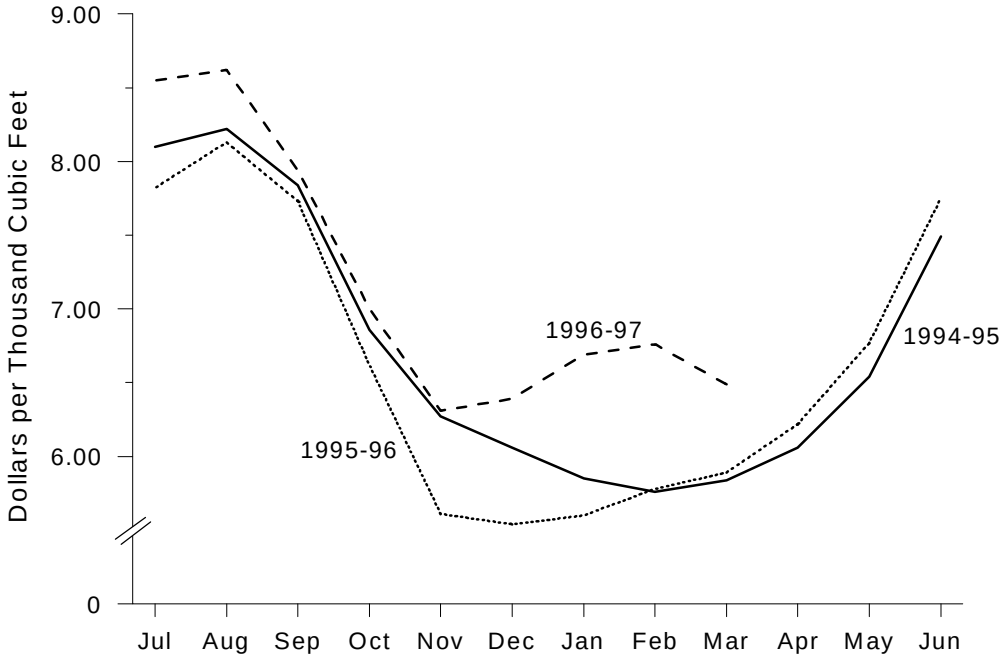
Weather Effects

Weather is a key factor in natural gas markets and played an important role in the exceptional rise in prices in 1996-97. Weather can affect both supply and demand. In the heating season, temperatures directly affect residential consumers as they primarily use gas for space heating.[2] Temperature extremes may affect gas field production by interrupting flow through well freezeoffs, but such disruptions tend to be limited in impact and of short duration.

[1]The *heating season* refers to the period from the first of November through the end of March. For ease of exposition, the terms *heating season* and *winter* are used interchangeably in this article.

[2]A discussion of this and other demand-related factors appears in *Load Forecasting Methods*, American Gas Association (1995). This study includes an analysis of Canadian residential consumption data that yields demand elasticity coefficients with respect to temperature of 0.17 and 0.24 for the fourth and first quarters of the year, which indicate that a 10 percent rise in heating degree days (HDD) will increase gas consumption about 2 percent. HDD are calculated as the deviation of average temperature from 65 degrees Fahrenheit, so successive temperature drops of equal size represent decreasing percentage increases in HDD. The corresponding decline in consumption response is consistent with the findings of "An Examination of Bend-Over in the Natural Gas Sendout Curve," *A.G.A. Forecasting Review*. This phenomenon arises as temperatures become extreme (perhaps below 20 degrees), causing heating appliances to approach maximum usage at which point consumption cannot increase with further reductions in temperature.

Figure FE1. Average Residential Gas Prices, July 1994 - March 1997



Source: Energy Information Administration, *Natural Gas Monthly* (June 1997).

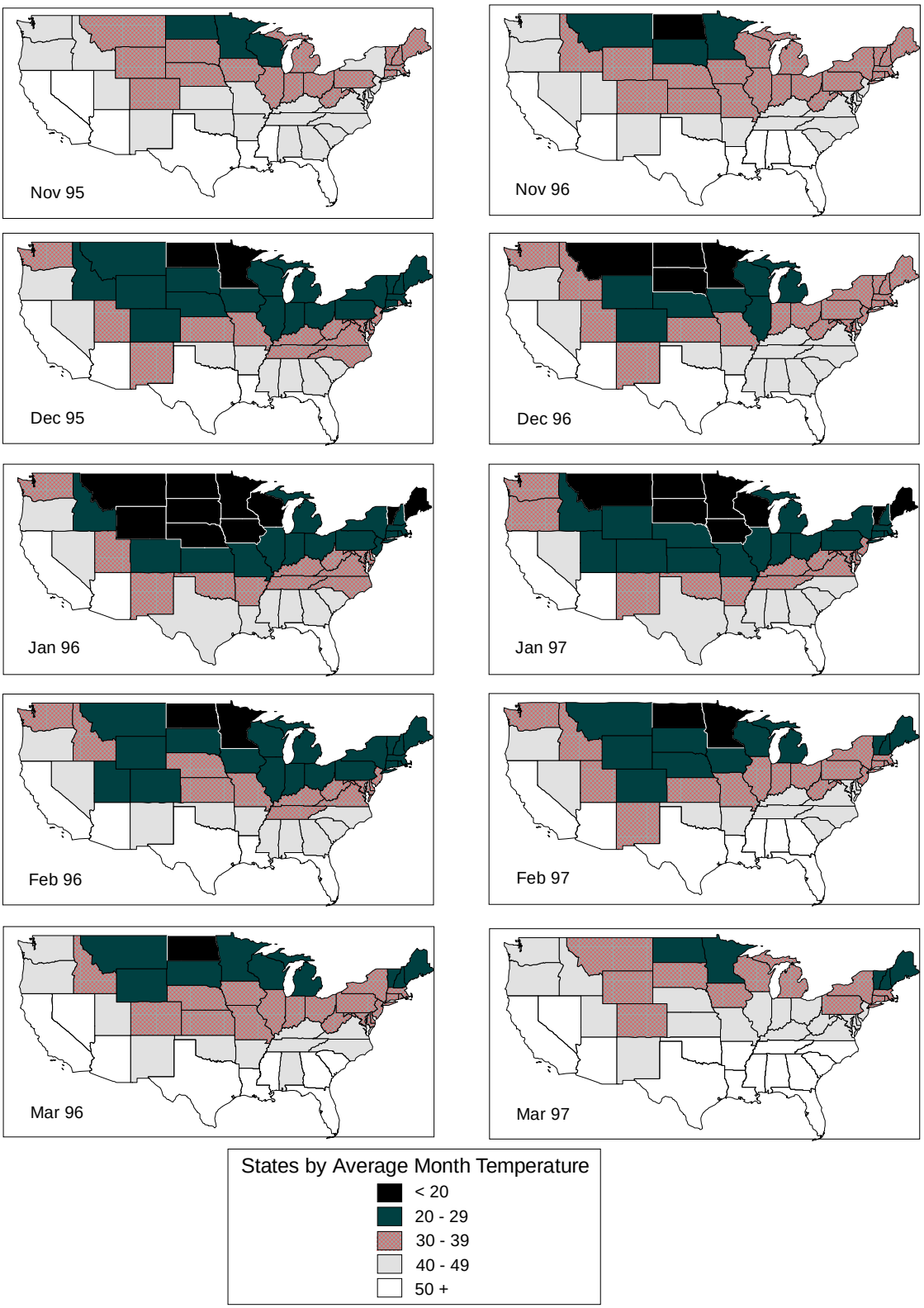
Gas consumption patterns during the past two heating seasons showed the strong effects of weather and differences in weather patterns. The 1995-96 heating season began with an unusually cold November and low temperatures persisted through subsequent months. The low temperatures were widespread, covering both the northern central area and the top tier of the eastern portion of the country (Figure FE2). The eastern portion in particular includes large residential gas markets with very high gas requirements during severe weather. Residential gas consumption in 1995 in Illinois, Michigan, New York, Ohio, and Pennsylvania was at least one-third of total gas consumption for the year.

The widespread low temperatures through much of the 1995-96 heating season caused large incremental demand overall that imposed stresses on the supply system and led to high price peaks. Storage supply was particularly important in meeting the additional demand as the eastern States have relatively limited amounts of indigenous production and rely primarily on domestic production from the South and Southwest and western Canadian supplies. Small amounts of liquefied natural gas (LNG) are imported but cannot be accessed quickly because of the extensive distance from the originating point.

Temperatures at the beginning of the 1996-97 heating season were even more severe than in November 1995. However, for the rest of the 1996-97 season, the severe temperatures tended to be more geographically focused and in smaller gas markets. The unusually cold November was followed by a month of considerably milder temperatures in the Northeast than those of December 1995. The January temperatures were similar in both years, although the average temperature in the northernmost States was slightly lower in 1997. February 1997 weather was much less severe, with freezing temperatures prevailing only in the Rocky Mountain States and the North Central area. March 1997 had above-freezing temperatures in all but five States (Figure FE2). The peak demand in 1996-97 was more centralized in the North Central States, which have access to potential supplies from all directions.

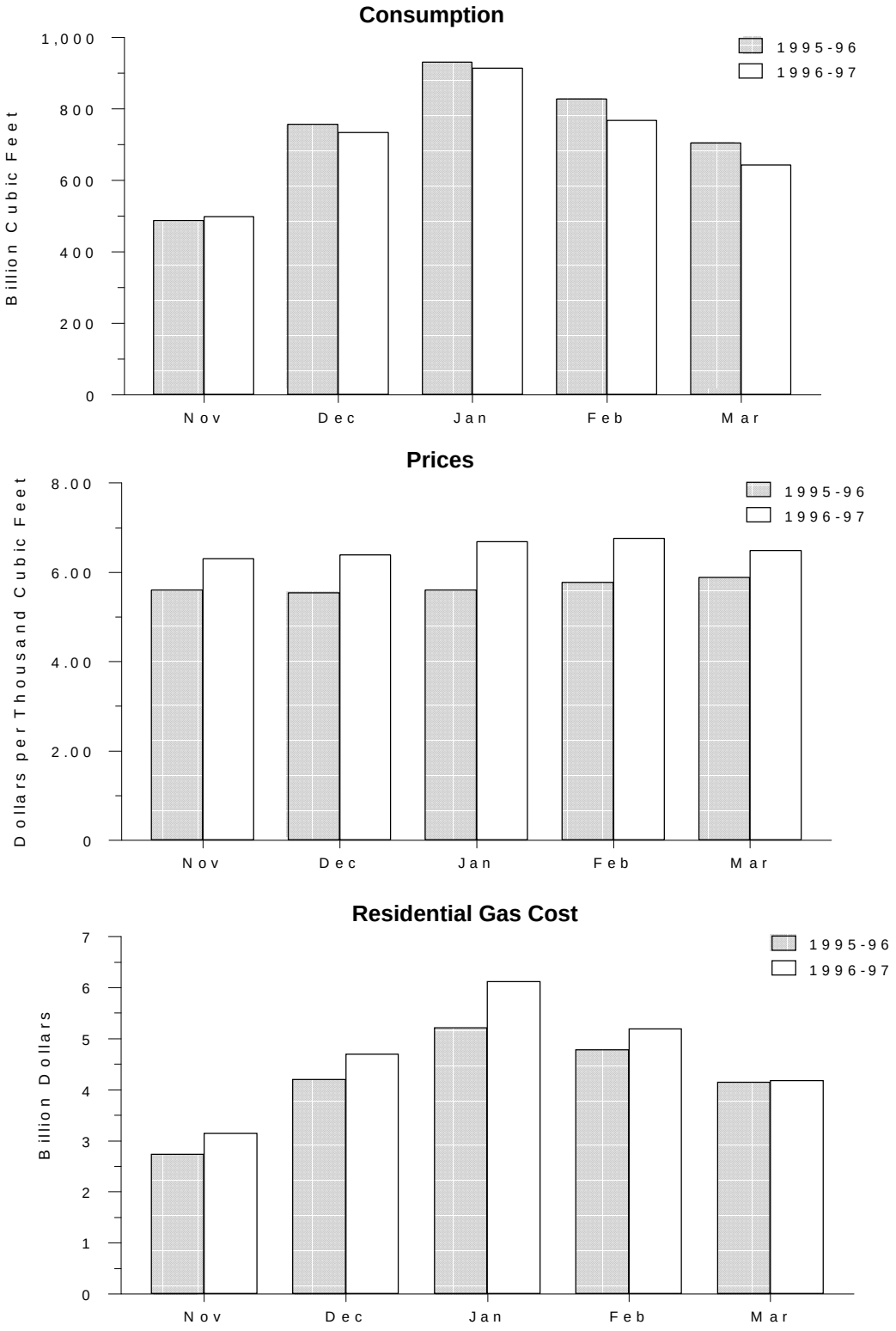
The generally milder weather in regions with major residential markets in the 1996-97 heating season compared with 1995-96 resulted in lower residential and total consumption. Residential consumption was 4.1 percent less than in the previous winter. Monthly residential consumption was 2.3 percent higher in November 1996 than in November 1995 but lower than year-earlier levels in all other months of the 1996-97 heating season. Residential gas use in March 1997 was 8.7 percent less than in March 1996 (Figure FE3). Total

Figure FE2. U.S. Winter Weather, 1995-96 and 1996-97



Sources: Energy Information Administration, Office of Oil and Gas, derived from National Oceanic and Atmospheric Administration, National Climatic Data Center.

Figure FE3. Monthly Residential Gas Consumption, Prices, and Total Expenditure for the Past Two Heating Seasons



Source: Energy Information Administration, *Natural Gas Monthly* (June 1997).

end-use consumption displayed a similar pattern, increasing slightly (0.6 percent) between November 1996 and November 1997 and falling in the other months. Total consumption by all end users this past winter was 2.3 percent less than in 1995-96.

The lower consumption suggests less demand, which would have lessened upward pressure on natural gas prices. Instead, as previously noted, monthly delivered residential prices during the period from November 1996 through March 1997 ranged from 10 to 19 percent more than prices in the corresponding months of a year earlier. The higher average residential gas prices drove January 1997 gas costs up 17 percent over the 1996 value, despite the lower consumption. Higher prices in the 1996-97 winter with lower consumption indicate that the market response was dominated by reduced supplies rather than demand changes. The market reacted to the low temperatures and high demand early in the 1996-97 winter, basing many of its decisions upon the weather patterns of the previous winter.

Supplies for End-Use Markets

Delivery of natural gas to the end user consists of a chain of services: field production, storage, transportation, and distribution. The availability of gas from these sources has a direct bearing on end-use gas prices. Natural gas production and import supplies in the Lower 48 States during the 1996-97 heating season were comparable or greater than in previous years. These abundant supplies served to mitigate the surge in prices, and they were to some extent a response to those higher prices.

U.S. gas production has been growing for a number of years and this trend continued in 1996 and into the heating season (Figure FE4). The increased production was achieved despite some difficulties in the field. For example, during cold weather in December 1996, freeze-offs occurred in the Gulf of Mexico, which affected nearly 1 billion cubic feet per day of gas production.[3] Greater losses were averted because producers conducted overtime operations to maintain flow and take advantage of the higher gas prices.

The growing production trend resulted from various factors including improved transportation. Twenty-six pipeline expansion projects were completed and placed in service during 1996 that either added capacity directly to the interstate network, improved intrastate service, or expanded access to producing fields or natural gas market centers.[4] These system enhancements provide access to new producing areas, such as the deep water regions of the Gulf of Mexico, and help reduce some bottlenecks that have hindered production growth in areas such as the San Juan basin in northwest New Mexico and southwest Colorado.

Similar to domestic production, natural gas imports increased this past year. Gas from foreign sources is an important element of total U.S. supply, providing 13 percent of 1996 consumption. Imports have even greater importance on a regional basis, with a major impact on gas availability and prices in large consuming markets, especially in the upper Midwest and Northeastern United States.

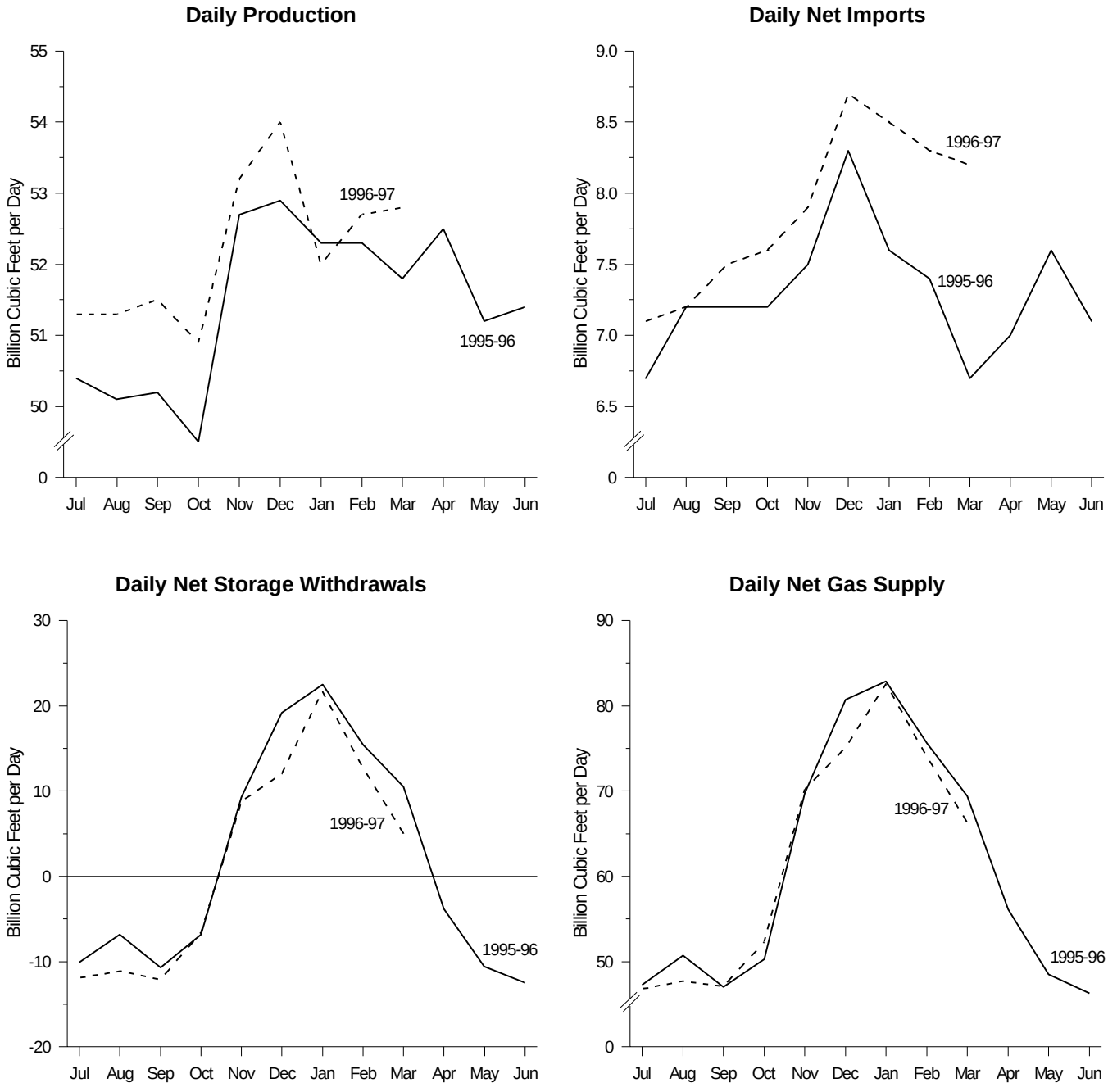
Net gas imports were higher in each month of the 1996-97 heating season compared with the previous winter (Figure FE4). The higher net imports reflect the impact of the higher price stimulus and the availability of new crossborder pipeline capacity between the United States and Canada. Monthly imports from Mexico continued through 1996 and into the heating season without interruption, as in 1995. Larger shipments of Algerian LNG were received in each month of the heating season, as the Algerian refurbishment project is finishing and more capacity comes on line. Also, LNG shipments from the United Arab Emirates (UAE) were received in December and January. (Gas from the UAE was received for the first time in September 1996.)

Thus, with domestic production and import levels all higher than the year before, a very different pattern was evident in the use of storage. Net gas volumes drawn from storage during November 1996 were comparable to those in November 1995, yet net withdrawals in all other months of the heating season fell short of year-earlier levels. Net storage withdrawals equaled 21 percent of gas consumption in the 1995-96 heating season, but only 17 percent in the most recent one. The significant deficiency in December 1996 storage withdrawals, relative to the prior year, resulted in lesser total gas supplies for the month, despite the larger quantities of domestic production and net imports (Figure FE4). Storage utilization in the past winter was influenced by a set of diverse factors including initial stock levels, the experience of the 1995-96 heating season, and spot prices in cash markets.

[3] "Cold Weather and High Prices Prompt Stellar Explanation," *World Gas Intelligence* (January 24, 1997).

[4] More detailed information on these projects is available in the Energy Information Administration's *Natural Gas Monthly* (Washington, DC, April 1997).

Figure FE4. Daily Average Gas Supplies by Month, July 1995 - March 1997



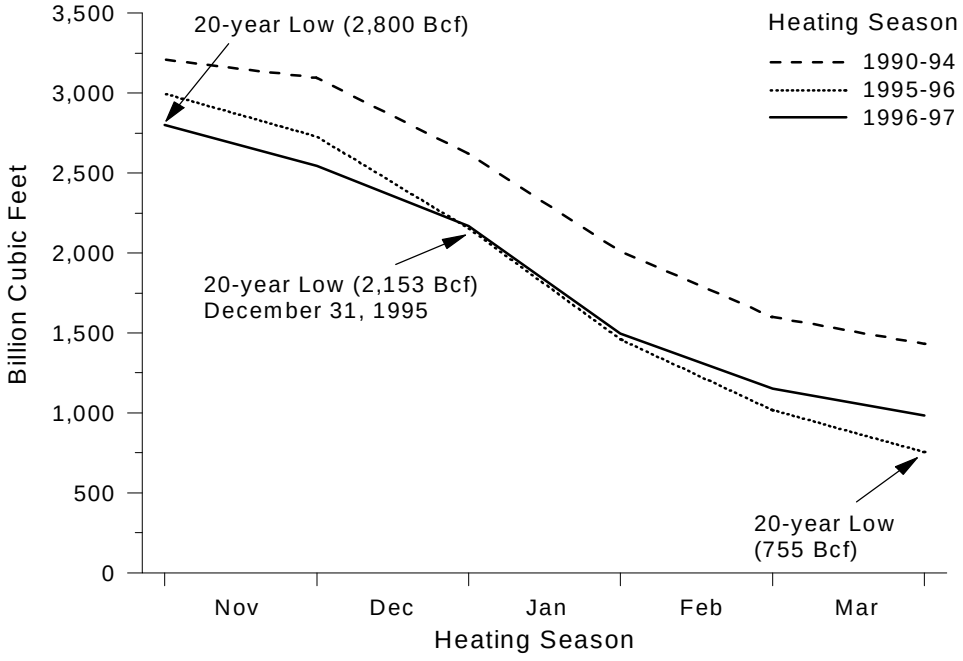
Source: Energy Information Administration, *Natural Gas Monthly* (June 1997). **Production:** Table 1. **Imports:** Table 2. **Storage Withdrawals:** Table 9. **Net Supply:** Table 2.

Storage Practices

Storage gas utilization practices appear to have been a major factor in determining prices in 1996-97. Storage is a key source of natural gas during peak demand periods because it can be located in the area of major consuming markets.[5] Additionally, the high drawdown rates provide deliverability to meet sudden demand surges that often are quite unexpected either in timing or intensity. Storage net withdrawals on average comprise about 20 percent or more of total U.S. consumption during the winter period, however reliance on storage varies widely for shorter periods. For example, on a typical winter day, storage gas meets 60 to 80 percent of natural gas requirements in Ohio.[6]

Working gas stocks of 2.8 trillion cubic feet (Tcf) on November 1, 1996, were slightly below the 3.0 Tcf available at the beginning of the 1995-96 heating season. These volumes are low relative to the more typical historical volumes (Figure FE5). Changes in inventory management, which have been motivated by new technology and the increased competition resulting from regulatory reform, are leading operators to maintain lower storage volumes. Without increases in other supply costs to compensate for less storage, overall system supply costs are reduced. New technology has improved performance of older underground storage units and allowed the use of salt caverns, both of which have higher delivery potential than depleted reservoirs using older technology. Increased deliverability despite lower quantities of gas in storage allows operators to reduce stocks without sacrificing the ability to meet target levels of gas deliveries.[7]

Figure FE5. Working Gas Levels



Sources: Energy Information Administration (EIA). **1990-1992:** *Historical Monthly Energy Review.* **1993-1994:** *Natural Gas Monthly* (June 1994). **1995-1997:** *Natural Gas Monthly* (June 1997).

[5]Storage is also a useful service in producing areas, although its role differs as a reflection of the difference in ownership. Producers prefer smooth production flows, and storage sites provide the option that compensates for the vagaries in takes for the market. Producers also maintain gas in storage to exploit arbitrage opportunities.

[6]Public Utility Commission of Ohio, *Weather Impacts on Gas Cost and Residential Winter Heating Bills, 1996-1997* (January 31, 1997), p. 6.

[7]High deliverability sites (salt caverns and refurbished depleted reservoirs) help to lessen the consequences of offpeak injection decisions. The ability to inject and withdraw gas rapidly allows for multiple "cycling" of the gas in a storage site. Gas is injected into storage even during periods of generally high consumption, such as the heating season. One advantage to owners of stored gas in high deliverability sites is the enhanced ability to capture monetary gains from transitory price changes. Another, arguably greater, advantage is the ability to restore at least some portion of storage volumes during the heating season, which reduces the burden of trying to anticipate months in advance the entire requirement for storage gas during the heating season.

Storage levels at the beginning of the winter showed some regional variation, with lower levels in production areas, but stocks in the East were close to last year's levels (Figure FE6). Higher mid-year prices in 1996 raised the cost of storage replenishment, but apparently did not discourage operators in the East from restoring stocks. For example, the Public Utility Commission of Ohio (PUCO) reports that storage facilities in that State were at 93 percent or more of capacity on November 1, 1996. Storage in the production areas, however, may have fallen somewhat short of the targets, not only because of the higher costs but also because of the greater opportunity cost of storing production rather than selling it at the higher prices. The high prices in cash markets were a signal of increased need for produced gas, and they would have motivated producer/operators to capture the higher revenue during mid 1996 while the opportunity was present.

Stocks of gas in storage are important because they constitute potential supplies of gas to the market. Storage drawdowns during November 1996 were about the same as in November 1995 (264 billion cubic feet (Bcf) vs. 278 Bcf). In contrast, storage withdrawals in December 1996 (276 Bcf) were only 63 percent of the 595 Bcf taken in December 1995. This level of drawdown is striking because working gas in storage entering December 1996 at 2,544 Bcf was 93 percent of the prior year level. Net withdrawals in January of both years were comparable. The 1997 February and March net withdrawals, however, exhibited considerably less reliance on storage, with gas supplied from storage at 80 and 48 percent of the 1996 levels.

Storage utilization decisions are considerably more complex than those associated with acquisition of other supplies. Storage decisions involve consumption expectations for a given day and succeeding ones, and the expected availability and price for replacement volumes. Decisions for storage gas use today, whether prudent or not, have implications for supply availability thereafter.

The reduced withdrawals of gas from storage in the first half of the heating season may have been a reaction to the industry experience in 1995-96. The heavy reliance on storage gas in late 1995 removed gas from inventories that was not replenished because of continued demands resulting from the persistent, widespread cold temperatures. Sporadic transmission bottlenecks during later winter months further jeopardized the ability of local distribution companies (LDCs) to deliver gas to their customers as needed.[8] Despite the low probability that weather will replicate itself in successive years, it seems operators in 1996-97 generally were reacting to experiences of the previous winter—especially in light of the low drawdowns in December 1996 when spot prices were quite high, providing lucrative arbitrage opportunities. Average weekly prices as measured at the Henry Hub ranged between $3.40 and $4.43 per million Btu (MMBtu) for the month, yet storage withdrawals were limited in all regions. In contrast, the much larger storage withdrawals in December 1995 were at a time when prices were no more than $2.42 per MMBtu in any week.

Low net storage withdrawals in February and March 1997 reflect the relative prices of gas supplies (Figure FE7). The Henry Hub price averaged $3.00 per MMBtu in the last week of January, but fell below $2.50 in the first week of February and continued to decline in successive weeks, reaching $1.85 in the final week of the month. The average weekly prices in March did not exceed $1.95. At such prices, spot gas purchases were the preferred, low-cost supply option, since gas from storage would have to be replaced with gas likely to be at higher prices, given the then-expectation of mid-1997 prices at approximately $2.00 per MMBtu.[9] The full cost of using storage gas includes not only the replacement cost, but the associated costs of withdrawal (of gas now) and injection (for replacement gas). Further, use of storage gas exposes the firm to the risk of future price increases, such as last year when prices rose from the end of the heating season into the summer.

Indefinite retention of gas in some storage facilities is discouraged by penalties that may be imposed when sufficient gas is not withdrawn by specified dates. Penalties are established on the basis of monetary charges, in-kind gas charges, or confiscated gas. However, these penalties are not in all storage arrangements. In a sample of 25 major storage operators,

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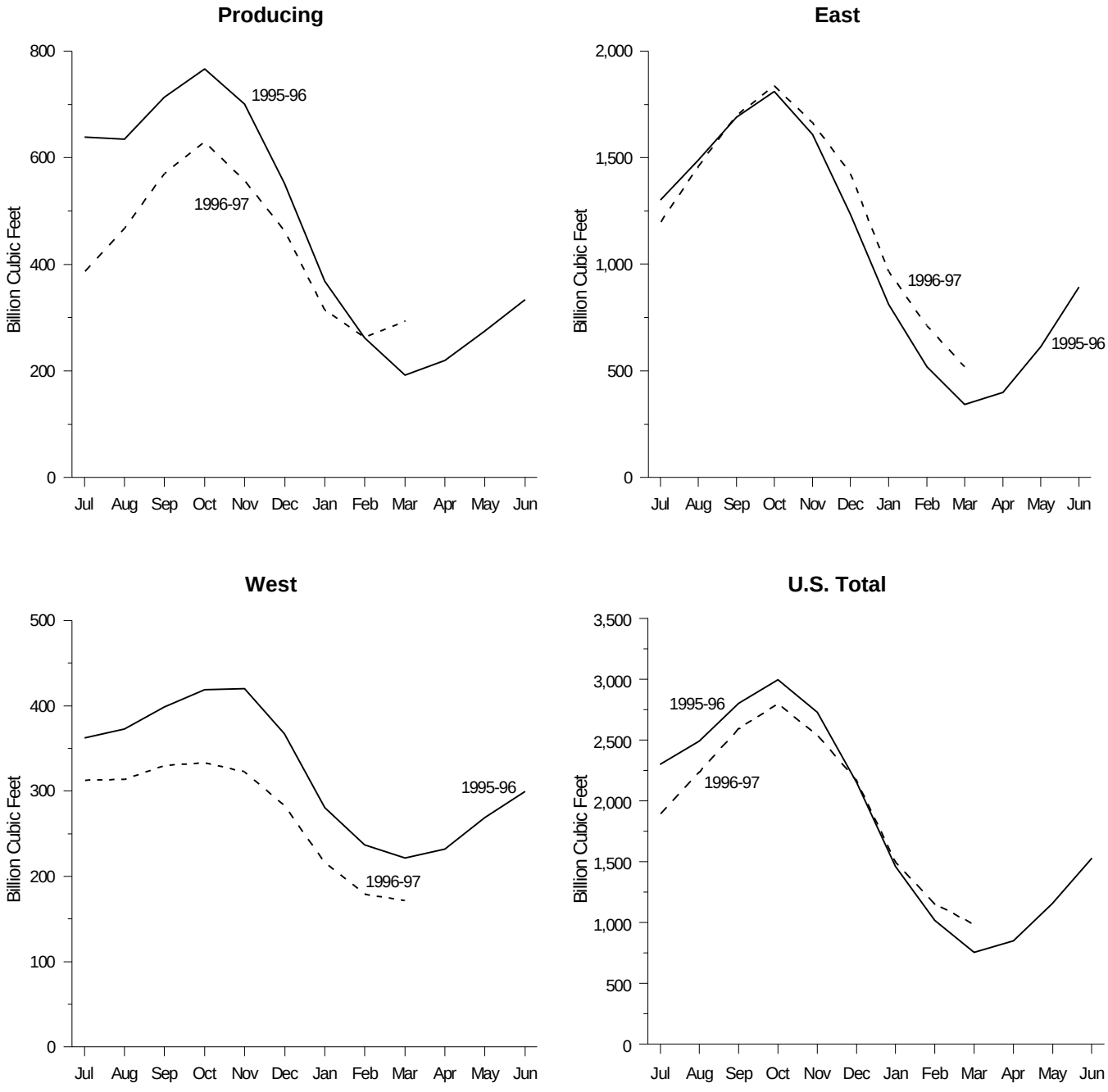
[8]Bottlenecks or other difficulties in the chain of supply services may manifest themselves in severe price movements, which can prove disruptive to market suppliers and producers. The spot market showed a remarkable degree of price volatility in 1995-96. For example, after 2 weeks of daily prices ranging between $2.13 and $2.83 per million Btu, the spot price at the Henry Hub surged from $2.58 to $14.00 when a sudden cold snap occurred in the week of January 29 to February 2, 1996. The daily prices fluctuated between $4.00 and $8.75 during the succeeding 2 weeks. Thereafter, daily prices at the Henry Hub averaged $2.90 per million Btu with reduced variability ($2.43 to $3.65). Elsewhere, prices closer to end-use markets also swung dramatically in early February. For example, local utilities in Chicago were reported to have paid as much as $46.00 per million Btu for some transactions.

[9]Pasha Publications, Inc., *Gas Transportation Report* (March 19, 1997).

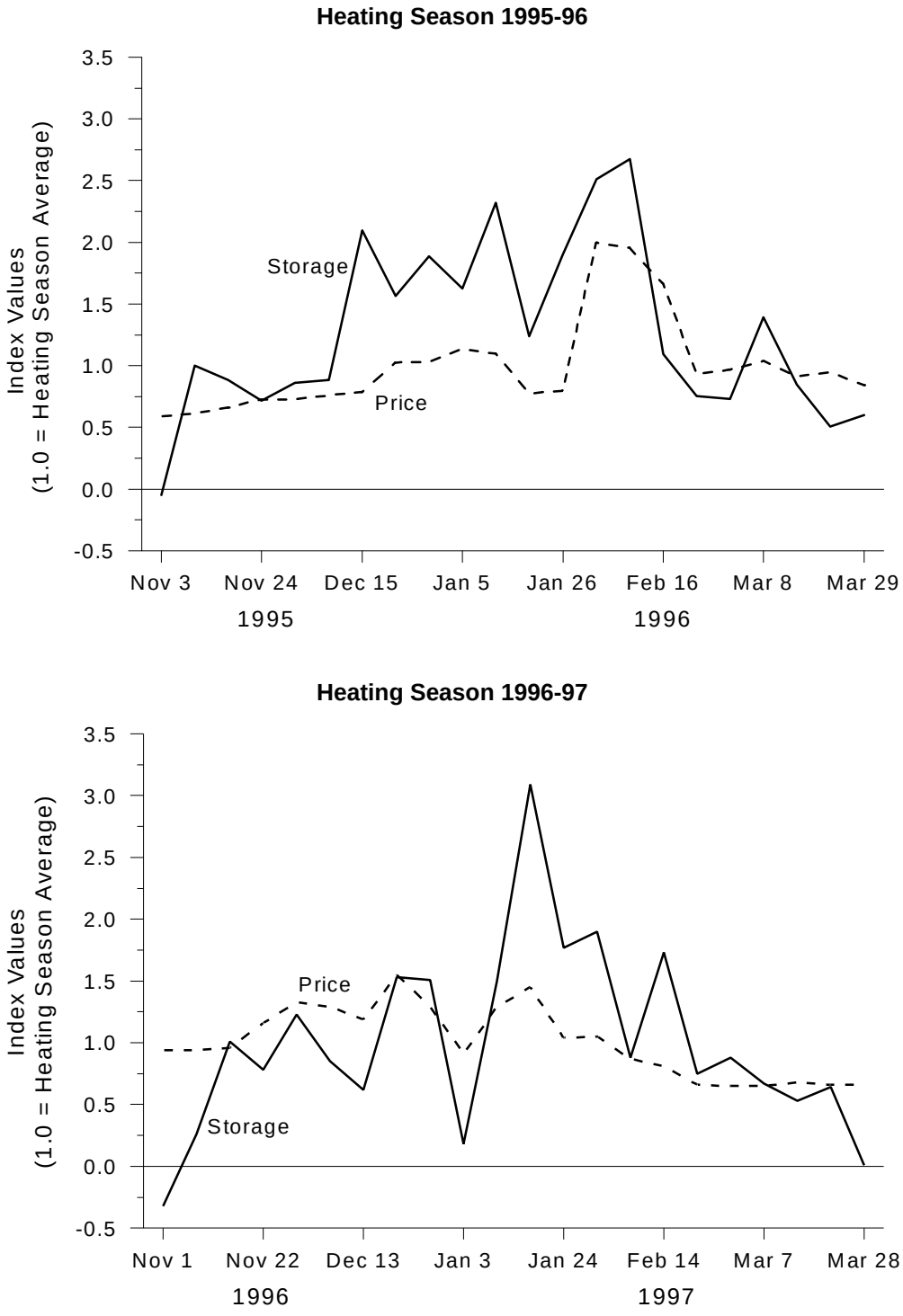
Figure FE6. Storage by Region, July 1995 - March 1997



Note: Regions are comparable to those used by the American Gas Association in its *Weekly Survey of Working Gas in Storage*. Because vertical scales differ, graphs should not be directly compared.

Source: Energy Information Administration, *Natural Gas Monthly* (June 1997).

Figure FE7. Comparison of Net Storage Withdrawals and Spot Prices



Sources: **Storage Withdrawals:** American Gas Association, *Weekly Survey of Working Gas in Storage* (November 1995-March 1996). **Spot Prices:** Pasha Publications, Inc., *Gas Daily*.

10 of the companies did not have any requirement to remove gas from the facility. Only two storage operators required 100 percent removal of customer gas, and that applied only to certain classes of customers. Most withdrawal requirements allow for a portion of gas to remain in storage—generally about 20 to 25 percent of maximum. Further, the reported penalties for noncompliance with the withdrawal requirement frequently represent a rather moderate cost. For example, the 1.2 percent fuel charge imposed by ANR Pipeline is the equivalent of 2.4 cents for gas costing $2.00 per MMBtu. Such a nominal fee for not withdrawing gas is not sufficient incentive to withdraw the gas, replace it with gas expected to cost $2.00 or more, and then also pay the injection fees. Gas on the cash market priced at below $2.00 in February and March was a far superior choice.

Despite the market outcome based on limited early use of storage during the past winter, some operators remain reluctant to change significantly because of their concerns regarding supply security, which is vulnerable to the uncertain changes in weather. A conservative withdrawal strategy in the early part of the heating season positions the utilities well in the event of a late season cold snap. Storage utilization practices also are established on the basis of technical factors. For example, the physical attributes of the aquifer storage facilities of Northern Illinois Gas (NIGas) affect delivery in such a way that NIGas adheres to a previously established schedule more than it allows variation in response to fluctuating economic incentives.[10]

Institutional Factors

Marketing gas to residential customers has been conducted for many years in a framework of regulated franchises. Although some regulatory reform is underway on an individual State basis, operational practices did not change greatly between the two heating seasons. For example, local utilities generally did not pass along the increased supply prices any faster this year than in the past (Table FE1). Billings from some utilities included adjustments for cost discrepancies from the 1995-96 winter because the payments that were estimated under a levelized plan differed from the actual costs. Residential customers in Iowa, Minnesota, Ohio, and Wisconsin had bills affected by these adjustments. However, at least in the case of one utility in Minnesota, the adjustment was a reduction to compensate ratepayers for charges that had exceeded necessary cost recovery.

Gas supply acquisition strategies by local distributors also have remained largely unchanged. A small utility in New Mexico did attempt to arrange for longer term supplies, but was not successful prior to last winter. LDCs generally maintained their approach to gas storage utilization practices between years. The pattern of net storage withdrawals, however, does seem to reflect a shift in how storage supplies are viewed during the heating season months.

The level of residential billings is affected by the billing mechanisms themselves, many of which do not promote efficient consumer behavior. The surge in consumption during the heating season might be tempered somewhat if consumers were more aware of current gas prices and the impact of their decisions on their monthly gas costs. Bills arrive after the billing period during which consumption decisions have been made, and the bill is stated in terms of totals or averages for the period. It is difficult at best for consumers to ascertain their marginal costs for decisions within the period.

Some public utility commissions (PUCs), such as that of New Mexico, have proposed the incorporation of "signal prices" into monthly billings. The signal prices would be a projection for one or two months that are intended to inform the customer. This proposal is unclear on a number of key issues. It is unlikely that the signal price would be the actual price charged without subsequent adjustments. If so, its motivational strength is open to question. Another issue is the consequence of incorrect price projections, which are inevitable. One example of the difficulty in projecting prices occurred in Ohio last winter, when LDCs twice filed applications to amend the Gas Cost Recovery (GCR) rates. Initially the LDCs filed applications to amend upward the rates that were in effect during November and December 1996. The same companies later filed applications to reduce their GCR rates to reflect the prevailing price of gas. Given the uncertainty surrounding price projections, unless signal price projections were produced by a mutually acceptable third party, there may be continual challenges to their reliability.

Effective price signals to residential customers also are masked by specialized residential billing procedures, such as levelized billings, that are designed to avoid unexpected large increases in the monthly cost when possible. This objective has resulted in the availability of

[10]Yet NIGas is reviewing the performance of its storage operation during the past winter to refine its storage utilization, although no major changes are anticipated. "Lessons Shape Utilities' Storage Philosophies," *Gas Storage Report* (March 1997).

Table FE1. Activities in Various States in the 1996-97 Heating Season

Activity	Illinois	Iowa	Minnesota	New Mexico	Ohio	Virginia	Wisconsin
			Change Between 1995-96 and 1996-97 Heating Seasons				
Percentage Increase in Natural Gas Costs to Residential Consumers, Jan. 1996 vs. Jan. 1997	45	25	35	70	35	27	20
LDC Cost Passthrough Method	No	No	No	No	No	No	No
LDC Use of Storage	No	No	No	No	No	No	No
LDC Acquisition Strategy for Natural Gas Supply	No	No	No	No	Yes	No	No
			1996-97 Heating Season				
Leftover Costs from 1996 in 1997	No	Yes	Yes	No	Yes	No	Yes
LDC Use of Futures Market	No	No	No	No	Yes	No	No

LDC = Local distribution company.
Source: **Price Change:** *Natural Gas Monthly* (June 1997), Table 20. **Other:** State public utility commissions.

consumer options such as budget-payment plans,[11] in which the consumer is charged a uniform rate for 11 months and discrepancies between the cumulative payments and costs are addressed in the 12th month.[12] Budget-payment plans obscure not only the marginal cost of additional gas units consumed on any day, but also the average cost for the month or season.

Natural Gas Markets

A factor that would lessen competition and cause prices to be unnecessarily high is undue market power. Some analysts suspect that the generally higher prices in 1996-97 are due to growing monopoly power of gas marketers. However, the data do not support such a finding. The Herfindahl-Hirschman Index (HHI),[13] as a measure of market concentration, does not show concentration among gas marketers that would be consistent with undue market power. Also, analysis of price differentials between stages in the supply chain finds no evidence of improper market performance.

The HHI based on the annual sales volumes for recognized gas marketing firms is 243 for 1996, indicating an unconcentrated market.[14] Naturally, the concentration estimates on a regional level would be higher in some cases. However, even an indication of regional concentration is not compelling evidence of undue market power unless there are contractual, physical, or regulatory obstacles that can impede effective interregional competition or constitute a barrier to entry. Transitory conditions may cause price surges that create short-term opportunities for additional revenues and profits. Sporadic events of this type can be viewed as a reward to risk taking (e.g., returns to a firm for maintaining speculative gas volumes in storage). It becomes a problem when it is systematic in occurrence, or industry participants can influence its intensity or duration. The industry structure as gauged by the HHI lacks strong firm concentration that would lead to market power.

The chief concern about market power is the ability of firms in an industry to sway prices unduly and thereby

[11]Information on the number of customers relying on this or other options tends to be nonsystematic, but anecdotal evidence indicates that roughly 33 to 50 percent of residential customers are on some type of specialized billing option.

[12]Complete reconciliation is not necessarily attained in a single month, often depending on the amount owed by the consumer. In fact, the objective of these plans is to "smooth" the amounts owed by the customer, and in practice, ad hoc adjustments are introduced to achieve this goal. For example, payments under a budget-payment plan may be adjusted upward, even when out of cycle, if costs have risen so much that further delays in cost recovery are likely to result in a substantial "shock" if allowed to accumulate until the next reconciliation month. Thus, even customers under a plan for payment smoothing are open to the impact of a sudden, large increase in upstream gas prices.

[13]A *Herfindahl-Hirschman Index (HHI)* is a measure of market concentration. The HHI for a market is the sum of the squares of each company's market share. The lower the HHI, the less market concentration and the greater likelihood of a competitive market.

[14]The calculated HHI is based on 1996 gas marketer data obtained from Benjamin Schlesinger and Associates, Inc., *Directory of Natural Gas Marketing Companies*, 11th Edition (May 1997). The Federal Trade Commission divides market concentration as measured by the HHI into three broad categories: (1) unconcentrated—HHI below 1000, (2) moderately concentrated—1000 to 1800; and (3) highly concentrated—above 1800. *Department of Justice and Federal Trade Commission Horizontal Merger Guidelines* (April 2, 1992), http://www.antitrust.org/law/mg.html#14.

create or sustain unfair economic advantages for themselves. Price is a key performance characteristic of the industry, and it can indicate the successful use of market power. Natural gas prices are measured at the wellhead, the citygate,[15] and as delivered to residential customers. Price differentials between separate stages of the supply process show the unit revenue received by operators at that stage and they indicate whether firms were exploiting the response of customers under extreme conditions to gain an exceptional pricing advantage.

Prices at the wellhead rose dramatically during the early part of the winter, increasing to $3.53 per thousand cubic feet in December 1996, an increase of almost 83 percent from the October 1996 level of $1.93. The difference between delivered prices and those at the wellhead fell during the recent winter and it is less than that in the prior heating season. This pattern in the total markup from the wellhead is mirrored also in the intermediate stages, whether from the wellhead to the citygate, or from the citygate to the residential consumer (Figure FE8).

The only portion of residential prices that increased is that contributed by wellhead prices. Wellhead prices were substantially higher in 1996-97 compared with the prior year. This price increase, in conjunction with the declines in delivery markups, resulted in a much larger share of final revenue attributable to production. The largest share of residential price associated with the production phase in the 1995-96 winter was 37 percent in December. This same share was 55 percent in December of the following winter (Figure FE9).

The price differentials do not support a finding of market power beyond the wellhead and market power at the wellhead level is unlikely in light of studies in the literature. Recent studies have supported findings of growing upstream market integration across North America, although market integration is not effective between all regions.[16] Also, patterns in price data for five market hubs indicate improved competition between regional upstream markets (see box, p. lxvi). Beyond the citygate, local distribution is within the purview of State authorities, so the price markup thereafter is primarily a reflection of the impact of regulation in the States.

[15]The *citygate* is the point or measuring station at which a gas distribution company receives gas from a pipeline company or transmission system. Source: Energy Information Administration, *Natural Gas Monthly*, DOE/EIA-0130(97/04) (April 1997).

[16]For example, Energy Information Administration, *Natural Gas 1996: Issues and Trends*, DOE/EIA-0560(96) (Washington, DC, December 1996), pp. 82-84; and National Energy Board of Canada, *Natural Gas Market Assessment: Price Convergence in North American Natural Gas Markets* (December 1995).

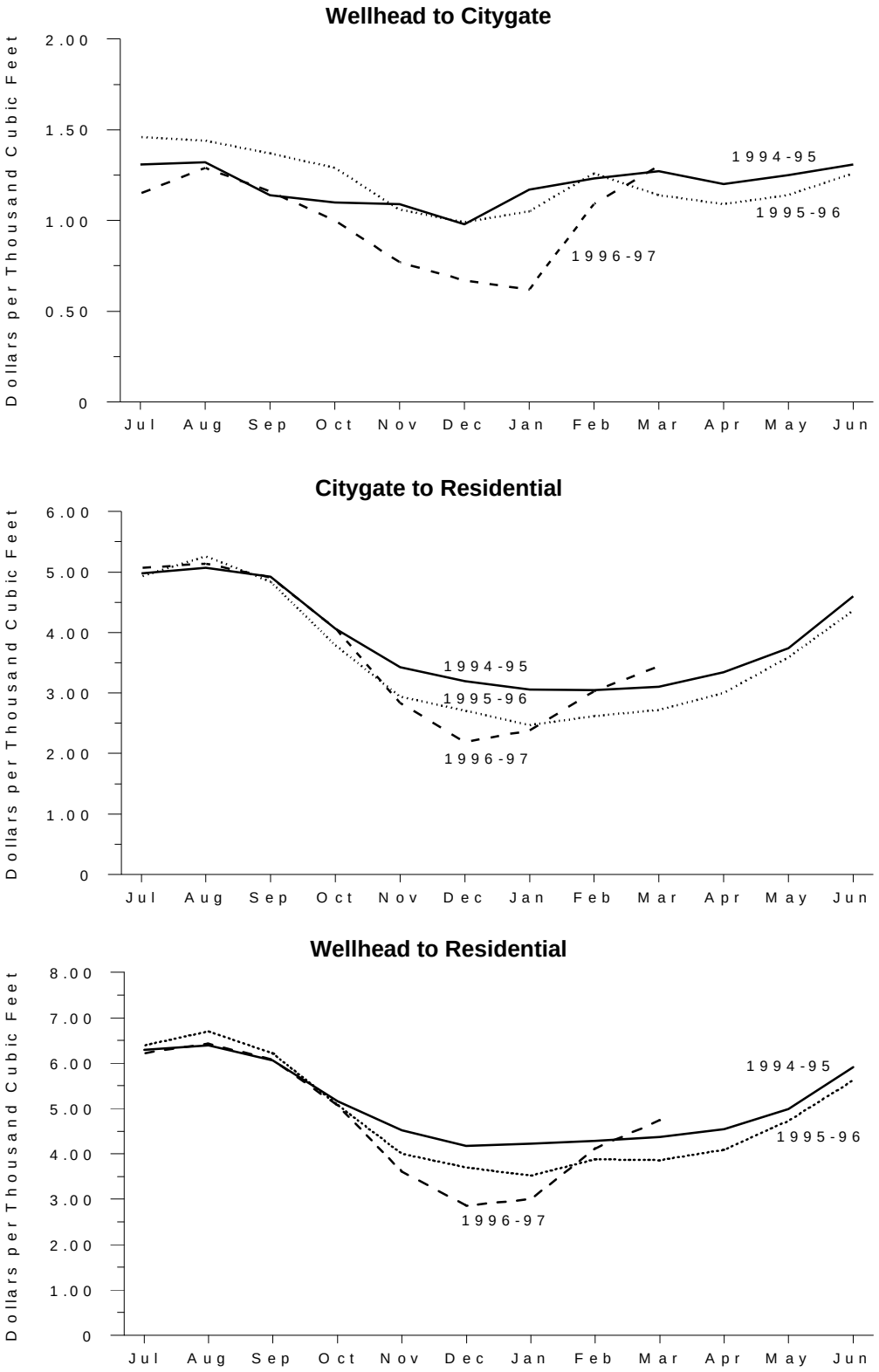
Implications for the Future

The experience of the 1996-97 heating season provides insights into possible, if not likely, outlooks for natural gas markets in future winters. The supply system—including producers, importers, storage operators, marketers, and LDCs—provided required volumes without incurring bottlenecks or the extreme spikes in spot prices seen in 1995-96. This improvement was offset at least partially by the generally higher prices throughout the winter— although the higher prices were in part because of the shift to a new price level that occurred in the rush to rebuild storage stocks by the start of the heating season. In some cases, such as that seen in New Mexico, the major contributing factors may be rather unique and so the extreme circumstances of this situation are not likely to recur (see box, p. lxvi).

A key element of the supply response system will continue to be gas from storage. The growing share of storage assets that consist of the newer storage preparation technologies or salt caverns ensures high deliverability potential for use on peak demand days. Further realization of storage advantages will depend on refinement of utilization strategies. One form of improvement would occur if operators diversify further in their storage utilization practices. Differing reactions to market conditions would tend to mitigate the immediate impact of conditions on markets and would lessen the lingering implications of storage decisions. The lack of singularity in individual behavior would benefit the markets, as actions that do not prove appropriate to subsequent conditions will be offset by that of other firms.

Two options that are being considered by PUCs in a number of States are improved consumer information in billings and better gas acquisition strategies by the LDCs. Improved price information is intended to promote efficient consumer behavior. As gas prices fluctuate within a season, the consumer reaction to the most recent gas bill may be inappropriate to the current market conditions. For example, the receipt of a higher gas bill in January or February 1997 reflects wellhead market conditions prevailing in earlier months. By February, gas supplies were relatively abundant judging from wellhead prices, which fell from $3.58 per thousand cubic feet in January to $2.73, a 24-percent decline. A reduction in residential gas use in February would have been inappropriate to the supply situation at that point, and it even might exacerbate the conditions behind the then declining upstream prices. Proposals to improve consumer information include the use of signal prices in billings, but price signals may not work as intended because of later adjustments or questions regarding their

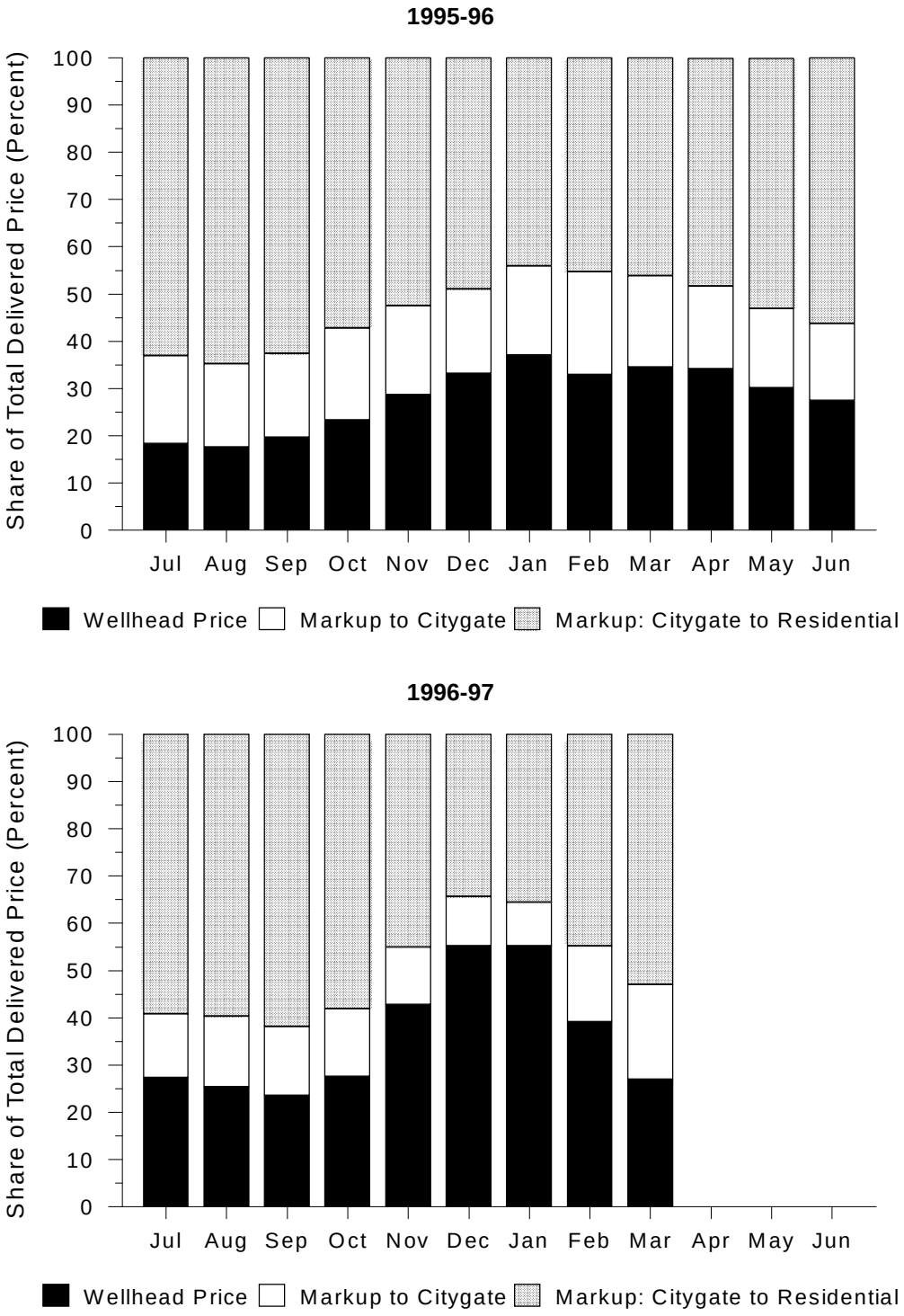
Figure FE8. Price Differentials, July 1994 - March 1997



Note: Because vertical scales differ, graphs should not be directly compared.

Sources: Energy Information Administration, *Natural Gas Monthly*. **1994-95:** September 1995. **1995-96:** September 1996. **1996-97:** June 1997.

Figure FE9. Decomposition of Residential Price



Sources: Energy Information Administration, *Natural Gas Monthly* (September 1996 and June 1997), Table 4.

Gas Markets in New Mexico and Minnesota

Residential billings vary between locations reflecting variation in geographic markets, weather conditions, and relative availability of gas supplies. For example, the increase in delivered price for natural gas to residential customers between January 1996 and January 1997 varied between 25 and 70 percent for a sample group of States (Table FE1). The differences in price patterns are an outcome of the relative demand and supply in each State, which include the institutions and any special events or circumstances affecting that State.

Two of the States with the highest price increases this past winter were New Mexico and Minnesota where markets were strongly affected by conditions particular to those States. Temperatures in both States were significantly lower in November and December. Minnesota temperatures were warmer than 1995-96 beginning in January, but relief did not arrive in New Mexico until March. Minnesota has relatively little storage capacity, with withdrawals being roughly 1 percent of annual residential consumption. New Mexico has greater storage capacity, which provides withdrawals of gas sufficient to satisfy more than half the annual residential consumption. The impact of the more persistent cold weather in New Mexico was exacerbated by increased out-of-State demand for New Mexico gas production caused by expanded transmission facilities.

New Mexico historically has been a net supplier of natural gas because of its bountiful resource base, including coalbed methane deposits in the San Juan basin. Recovery of coalbed methane deposits for markets was stimulated greatly by the special production tax credits granted under Section 29 of the Windfall Profits Tax Act of 1980. These credits were established for 10 years of production for all coalbed recovery wells begun by the end of 1992.This sunset provision resulted in a surge of drilling for coalbed development during the early 1990s. Coalbed methane recovery projects require an extended period for dewatering of the formation during which gas production increases. This incremental supply in New Mexico served to depress prices as local demand growth did not keep pace. Spot market prices for New Mexico show a large difference for sales at the Blanco, New Mexico hub up to the end of the 1995-96 winter (Figure FE10).

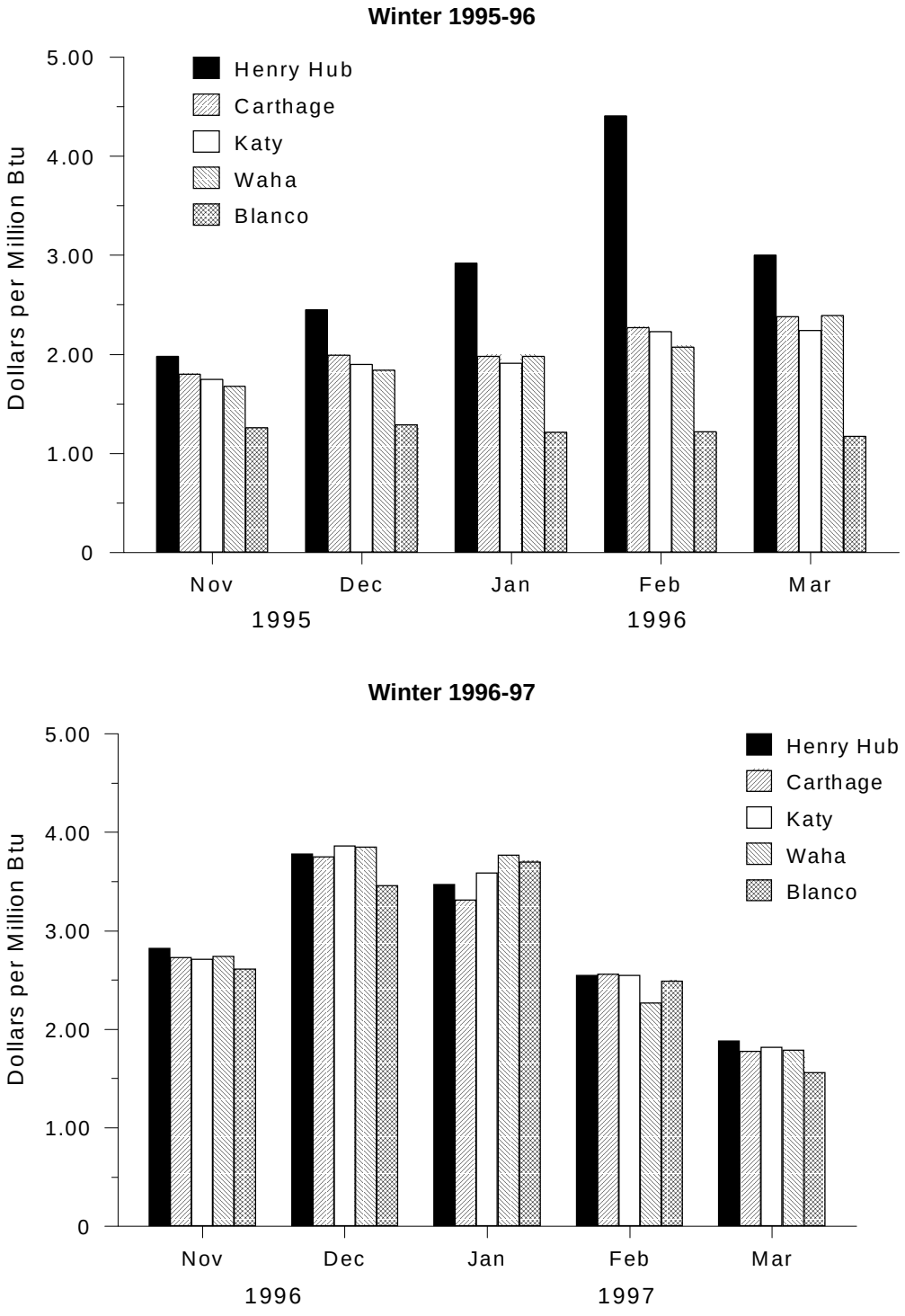
This price discrepancy indicates a lack of market integration between New Mexico and other markets. Pipeline expansion projects in the San Juan area, such as the lower section of the Transcolorado pipeline system (120 million cubic feet per day (MMcf/d)) and the San Juan expansion of Transwestern Pipeline company (255 MMcf/d), have relieved bottlenecks that have hindered the flow of production out of the area and improved producer access to potential customers in eastern and midwest markets. These two projects provide combined capacity expansion of 137 billion cubic feet annually, which is equal to 8.4 percent of New Mexico production in 1995. Improved access of San Juan gas to the Blanco hub in northern New Mexico also enhances the marketability of produced volumes. This expansion increased the effective demand for the gas by allowing access to New Mexico supplies for customers that otherwise were excluded.

The inevitable trading by gas purchasers between supplies of varying prices causes a convergence of prices between New Mexico and other hubs that is apparent by the beginning of the 1996-97 heating season. The prices in the 1996-97 heating season show a uniformity that contrasts greatly with the previous year. The November 1996 prices are between $2.61 and $2.82, which range is 7.7 percent of the mean. This is substantially below the 42 percent variation in prices during November 1995, when prices were between $1.26 and $1.98. Prices in the 1996-97 heating season are grouped more closely with variation of less than 13 percent relative to the mean in each month. This contrasts to the more than $3.00 discrepancy in prices during the 1995-96 heating season, which is 85 percent around the mean. The Blanco spot price in November 1996 is more than double that of November 1995. Another characteristic attributable to improved market integration is the similarity in monthly spot price movements. The Blanco spot price varies only slightly in 1995-96 despite the significant price shifts occurring elsewhere. The Blanco price in 1996-97 obviously has a stronger association with that of other markets.

A consequence of these developments to improve markets across the Lower 48 States is that the degree of market isolation previously affecting prices in New Mexico was greatly reduced entering the 1996-97 heating season. Exposure to external market factors was heightened for residential customers by a heavy reliance by State utilities on spot purchases for supplies. It is expected that this strategy provided ratepayers substantial savings in prior years due to the depressed prices of the area, however, it was not well positioned for 1996-97 as things turned out. Consumers in New Mexico, with higher priced gas and the need for more gas owing to the colder temperatures, were left with bills that were often double and triple those of the prior year.

The impact of such dramatic changes in energy costs from year to year is not lessened by arguments regarding increased market efficiency and improved long-term benefits. The State PUC held hearings with Public Service of New Mexico, the major LDC in the State. A key subject of inquiry in the hearings concerned the prudency of gas acquisition strategies that relied so heavily on spot market purchases. The PUC eventually found the utility was not imprudent in its acquisition practices, but it did encourage Public Service to utilize options such as price hedging tools. The interest in price hedging as a utility option to enhance gas acquisition practices is being expressed by PUCs in other States, such as Ohio, although it generally has not been widely pursued by LDCs to this point. They cite concerns about cost recovery when losses are incurred due to involvement in trading for price hedging.

Figure FE10. Monthly Heating Season Cash Market Trading Prices at Five Major Hubs



Source: The Oil Daily Co., *Natural Gas Week* (March 31, 1997), p. 17.

reliability. Additionally, this issue may be moot, however, if residential customer demand is so highly inelastic that reduced consumption in response to higher prices is effectively precluded.

A major feature of gas acquisition strategies is the associated costs. The PUCs have encouraged utilities to improve their gas acquisition by stabilizing prices through hedging in the futures market.[17] Futures trading allows market participants to establish the terms of expected transactions now as an alternative to simply allowing events to unfold and accept the rewards or penalties as they occur. Possible foregone profits or slightly higher costs are considered a preferred alternative to the uncertainty that can be detrimental in many ways, such as planning or attracting investment capital.

An LDC that correctly anticipated the rise in natural gas prices in the 1996-97 winter could have purchased gas for future delivery and avoided the high costs that prevailed later; however, *correct* expectations are a key requirement. Futures trading in practice is uncertain and it involves market sophistication at a much different level from that of the traditional cash market. The largest benefits tend to be gained when trades are made early, but many industry participants had a quite unclear picture of the pending heating season even on November 1, 1996.[18] The price for December deliveries at the Henry Hub remained unclear through the middle of the month and even very close to the settlement date. December deliveries were priced at $2.728 per million Btu on October 31, $2.662 on November 1, $2.908 on November 15, and $3.901 on November 21. The spot price for the Henry Hub in December averaged $3.78.

LDCs sometimes claim reluctance to participate in futures trading due to uncertainty regarding the treatment of any gains or losses, both of which are inevitable. Allowable cost recovery items recognized by PUCs varies by State and sometimes over time. One concern of LDCs is that all gains from futures trading will be distributed to the ratepayers, while any losses remain with the LDC shareholders. In one clear case, the PUC in Connecticut announced an 80/20 policy. The LDCs will be allowed to retain 20 percent of all gains, but they are liable for 80 percent of any losses. This asymmetric approach was not well received by the LDCs, who stated that this is an incentive not to participate in such trading.[19]

Futures trading is well suited to stabilize prices within a certain range, but its attainment may conflict with attempts to minimize costs. An LDC that capped its acquisition prices by futures trading may be criticized if an event such as an unexpectedly warm winter depresses prices below expectations. The prudency of such decisions is a difficult performance measure to capture. State authorities are reluctant to grant waivers from all review. One approach might be to diversify the supply portfolio to avoid a strong impact from unfortunate events affecting gas supply from any one area. The virtually complete reliance on spot purchases by major New Mexico utilities left them unguarded from the spot price spikes in 1996-97.

Futures trading during the early portion of the past heating season eventually contributed to higher prices. Many traders and marketers sold short, expecting prices to decline or not rise significantly.[20] The later price runup forced these traders to rely on the cash market to cover their positions, which would have exacerbated the price rise in two ways. Contract fulfillment under these circumstances comprises inelastic demand because as a fixed obligation, it is not price sensitive. Also, it would stimulate demand by effectively discounting prices to end users from what they otherwise would be. As the winter proceeded, the high price volatility led producers and other market participants to step aside, leaving futures trading for mostly speculative purposes. The eventual rise in prices did entice producers back into the market to capture high prices for new production. The introduction of this incremental supply later in the year was expected to work against maintaining price levels. Spot prices did decline to below $2.00 per million Btu in the latter part of February. The incremental supplies, however, seem to have been offset by the need to replenish storage levels, which has served to restore prices to levels above $2.00.

There is a final aspect of futures trading by LDCs that concerns the movement to competitive markets at the State level. A cornerstone provision of this shift is retail unbundling, in which the LDC offers major functions or services, such as sales, storage, and transmission, to the market as separate items with prices reflecting costs of that service alone. This functional division of the firm

[17]Futures contracts are obligations to buy or sell natural gas at an agreed price on a specified future date. Futures trading is just one of a number of financial tools that can be used to hedge price risk. For illustrative purposes, the present discussion will not explicitly include the use of other instruments, such as options, because the basic conclusions remain unchanged.

[18]Pasha Publications, Inc., "Market Uncertain Heading into November," *Gas Daily* (November 4, 1996).

[19]Pasha Publications, Inc., "Utilities call Connecticut Limits 'inappropriate,'" *Gas Daily* (April 28, 1997).

[20]"Cold Weather and High Prices Prompt Stellar Explanation," *World Gas Intelligence* (January 24, 1997).

promotes competition by disallowing the monopoly franchise established in one area, such as transmission service, to bestow market power on other services that would otherwise be offered on a competitive basis. Some LDCs have taken the initiative under the unbundling movement to focus operations in delivery services only. Without involvement in the merchant function, LDCs will not be acquiring gas for resale and futures trading is unnecessary.

The natural gas market has changed fundamentally during the past decade. The shift from intensive regulation to a highly competitive system has required tremendous changes in operations. The great success of the industry in performing well while adapting to these changes has sometimes imposed high costs on consumers. The long history of the industry belies its relative unfamiliarity with the present situation. Today's industry has been characterized as a relatively "immature" one because of its recent transition,[21] and so some "growing pains" may be inevitable.

Conclusions

Competition is increasing in U.S. gas markets. The overall nature of the market outcome—prices and volumes—depends on the interaction of the entire set of participating entities: producers, consumers, and infrastructure operators (e.g., storage, transportation, and hubs).

The system seemed to perform better in 1996-97 than in the prior heating season. Although prices were higher, the system avoided the extreme price spikes that occurred in some localities (e.g., Chicago) during the 1995-96 season. The 1996-97 price pattern reflects the improved interconnectedness of the system, which supports effective competition between regions of the Lower 48. Storage utilization during the past heating season may be questioned in light of subsequent events, but the strategy does not appear to be unreasonable. The early reliance on storage gas in 1995-96 left lower-than-preferred levels of gas as inventory, which became a critical factor when the severe temperatures persisted in major consuming locations. On the other hand, the lesser reliance on storage gas in early 1996-97 greatly contributed to increased prices for marketed production. The large volumes of gas remaining in storage were not necessary when temperatures abated and consumption declined.

The industry most likely will experience some growing pains as it settles into the new competitive environment. Strategies such as the conservative storage policy this past winter may reflect an approach in which the most recent problems are accorded highest priority. Industry approaches will continue to change as the industry evolves, but price shifts will still occur. These price changes are the communication mechanism for market participants.

Effective pricing signals, however, are not necessarily consistent with smooth (or low) prices. The actions required to negate price shifts generally cannot be expected in anticipation of the conditions. For example, the high prices this past winter led producers to operate crews at overtime rates in order to get the benefit of the higher prices. Such actions mitigate a price rise but cannot prevent it. It is not economically sensible to react before the price rise because the market signal has not been received. The shrewd operator will try to anticipate market changes and position the firm to take advantage of them, but the action will await the price as an incentive.

The performance of the natural gas industry during the recent winter is encouraging, although it should not be construed as indicative of expected success under all future conditions. The ability to satisfy any set of demands may be highly conditional on the particular intensity, timing, and spatial distribution of consumption requirements. Further validation of the system requires success under differing conditions in subsequent heating seasons.

A difficulty with attempting to achieve stable gas prices is that the uncertain events are not independent. Thus, losses may be coincident and overwhelm the system. For example, a severe weather event could lead to heavy gas demand that would drive up prices. Success in shielding customers from these signals will not provide appropriate behavioral responses by consumers. Acceptance of this situation depends on the ability of the system to accommodate residential customers under these conditions and the equitable allocation of these costs in revenue recovery by the LDCs.

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[21] Pasha Publications, Inc., "AGA Finds LDC Winter Purchasing Habits in Flux," *Gas Daily* (June 11, 1997).

Highlights

Overview

This issue of the *Natural Gas Monthly* presents the most recent estimates of natural gas supply, consumption, and prices from the Energy Information Administration (EIA). Estimates for many of the data series run through August 1997.

Preceding this section are three articles, two of which deal with imports and exports and one with natural gas prices in the residential sector. The first article, "Worldwide Natural Gas Supply and Demand and the Outlook for Global LNG Trade," focuses on liquefied natural gas (LNG) and is adapted from testimony given by EIA Administrator, Jay Hakes, to the Senate Energy and Natural Resources Committee on July 23, 1997. The special report, "U.S. Natural Gas Imports and Exports--1996," presents and evaluates final 1996 data. Net imports of natural gas rose for the 10th consecutive year in 1996 as pipeline imports from Canada reached a new record level of 2.9 trillion cubic feet. The feature article, "Natural Gas Residential Pricing Developments During the 1996-97 Winter," analyzes the conditions that resulted in significantly higher residential expenditures for natural gas in the 1996-97 heating season compared with 1 year earlier.

Highlights of the most recent, monthly natural gas data are:

- The national average wellhead price rose 12 percent from April to May 1997, reaching an estimated $2.04 per thousand cubic feet. Although monthly average wellhead prices have remained more than $1.00 below the January 1997 estimate of $3.46 per thousand cubic feet, the cumulative average price through May 1997 is 12 percent higher than in 1996.

- Net injections of natural gas into underground storage during the 1997 refill season (August) have run behind the rate in 1996, yet the level of working gas in storage by the end of August, estimated to be 2,366 billion cubic feet, is 6 percent above the level in 1996.

- End-use natural gas consumption is close to matching last year's record-setting pace. Consumption in August 1997 is estimated to be 1,360 billion cubic feet, nearly equal to the July level. Cumulatively through August, end-use consumption is only one-half percent lower than in 1996.

Supply

Dry natural gas production continues at a steady pace during 1997, with the daily production rate for each month through August ranging from 51.5 to 52.4 billion cubic feet per day. Production in August 1997 is estimated to be 1,596 billion cubic feet, or 51.5 billion cubic feet per day (Table 1). Cumulative production through August 1997 is virtually unchanged from that of the same period in 1996 (Figure HI1).

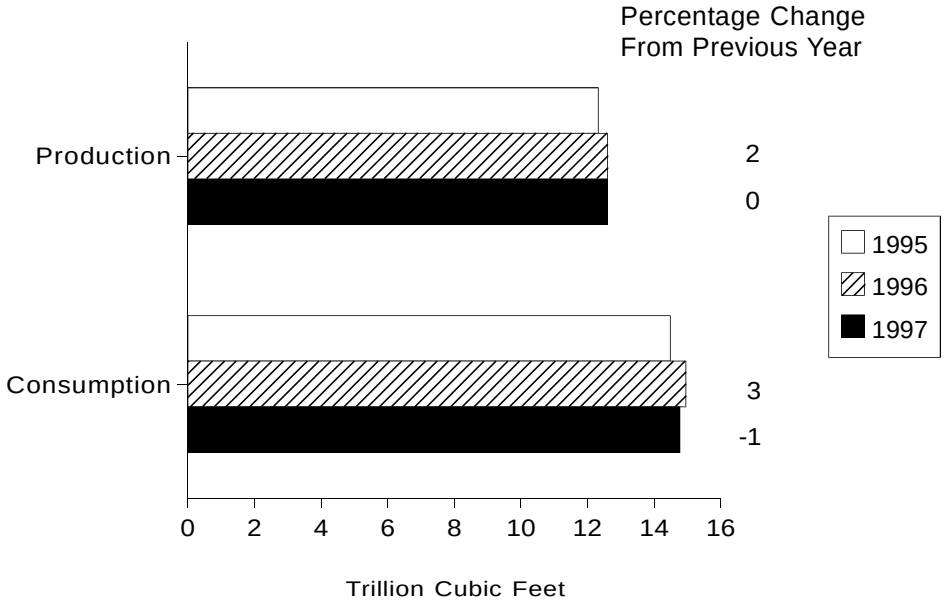
Net imports of natural gas in August 1997 are estimated to be 243 billion cubic feet, or 7.8 billion cubic feet per day, the same as in July 1997 (Table 2). The August level is 10 percent higher than in August 1996, but cumulatively, for January through August 1997, net imports are only 5 percent higher than in 1996.

Net injections of natural gas into underground storage are estimated to be 333 billion cubic feet in August 1997 (Table 9). Net injections during the nonheating, or refill, season have been lower every month of 1997 compared with 1996. Net injections in August were 3 percent below that of August 1996. Still, working gas in storage remains ahead of last year's level, although the gap has narrowed steadily during the year. Working gas began the refill season in 1996 at the lowest level ever recorded (records began in 1976). Thus, as of March 31, 1997, working gas was 30 percent above that of 1996. By August 31, 1997, working gas was an estimated 2,366 billion cubic feet, only 6 percent ahead of last year's level (Figure HI2).

End-Use Consumption

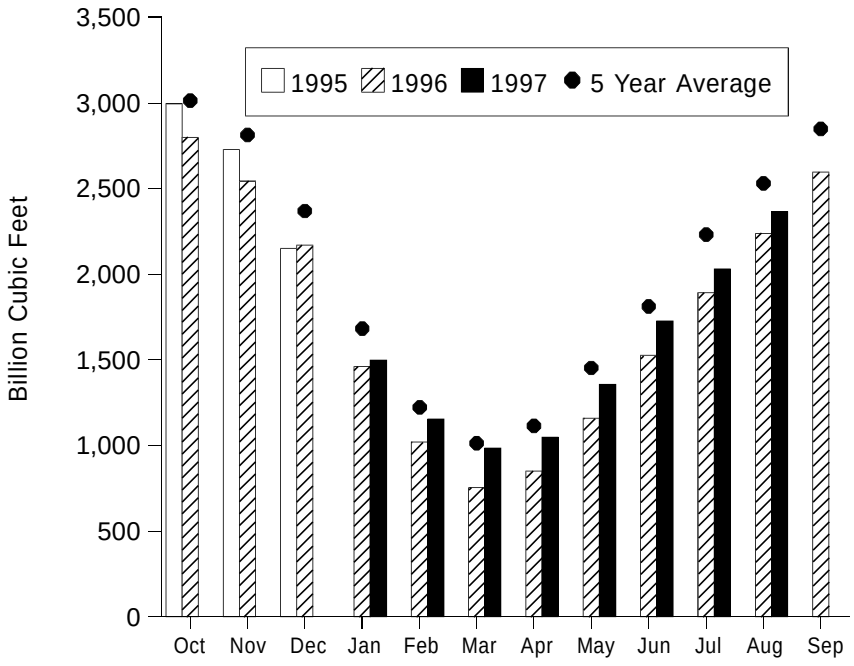
End-use natural gas consumption is estimated to be 1,360 billion cubic feet in August 1997, almost matching consumption in July. Cumulatively through August, end-use consumption in 1997 is approximately one-half percent lower than in 1996, which had been a record-setting year. Industrial consumption for January through August 1997 has increased compared with 1996, nearly offsetting declines in the residential and commercial sector. Cumulative electric utility consumption of natural gas for January through May 1997 almost equals that of 1996 (Table 3).

Figure HI1. Natural Gas Production and Consumption, January-August, 1995-1997



Source: Table 2.

Figure HI2. Working Gas in Underground Storage in the United States, 1995-1997



Note: The 5-year average is calculated using the latest available monthly data. For example, the December average is calculated from December storage levels for 1992 to 1996 while the January average is calculated from January levels for 1993 to 1997. Data are reported as of the end of the month, thus October data represent the beginning of the heating season.

Sources: Form EIA-191, "Underground Natural Gas Storage Report," Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and Short-Term Integrated Forecasting System.

Residential and commercial natural gas consumption are estimated to be 114 and 132 billion cubic feet, respectively, in August 1997. Both levels are down from July, by 9 and 4 percent, respectively. Residential use of natural gas is also down from a year ago, by 3 percent for August, but in the commercial sector, August represents the third month in a row that commercial natural gas consumption was above that of 1996. However, cumulatively through August, commercial consumption in 1997 remains 2 percent below that of 1996 (Figure HI3). Cumulative residential consumption is 6 percent below that of 1996.

In the industrial sector, cumulative natural gas consumption through August 1997 is running nearly 2 percent ahead of the level in 1996. The estimate for August 1997 consumption is 717 billion cubic feet, 1 percent above the level in July 1997 and 1 percent above the level of 1 year ago.

Monthly estimates of electric utility consumption of natural gas have shown the widest percentage variation of all the end-use sectors compared with last year. Estimates for this sector are only available through May, but in that time, natural gas consumption in 1997 has been anywhere from 17 percent below that of 1996 (in January) to 21 percent above (in March). Estimated consumption for May 1997 by electric utilities is 231 billion cubic feet, 13 percent lower than in May 1996, but a 20-percent increase from April 1997. Cumulatively through May 1997, electric utilities have consumed 894 billion cubic feet of natural gas. During the same period in 1996, they had consumed 895 billion cubic feet.

Prices

Most natural gas price estimates for May 1997 are close to the levels seen in May 1996 (unadjusted for inflation), but the cumulative average prices, for January through May, remain above their 1996 levels. Electric utilities, where prices lag the other series by a month, are the exception. The estimated price of natural gas for electric utilities in April 1997 is 14 percent lower than in April 1996, and cumulatively, the average price is almost 1 percent lower than in 1996.

Recent monthly wellhead price estimates remain much lower than the $3.46 per thousand cubic feet seen in January 1997, but the national average estimate rose 12 percent from April to May 1997, reaching $2.04 per thousand cubic feet (Table 4). This equals the price reported for May 1996. Cumulatively, the average wellhead price in 1997 is 12 percent higher than in 1996.

The pattern in the price of natural gas at the city gate has been similar to that of wellhead prices. After starting off in January 1997 at a peak of $4.26 per thousand cubic feet, the estimated average city gate price fell to $2.65 in April 1997, then rose 19 percent to $3.15 in May 1997. This May price is 1 percent lower than in May 1996, but cumulatively for 1997, the average city gate price is 11 percent above that of 1996.

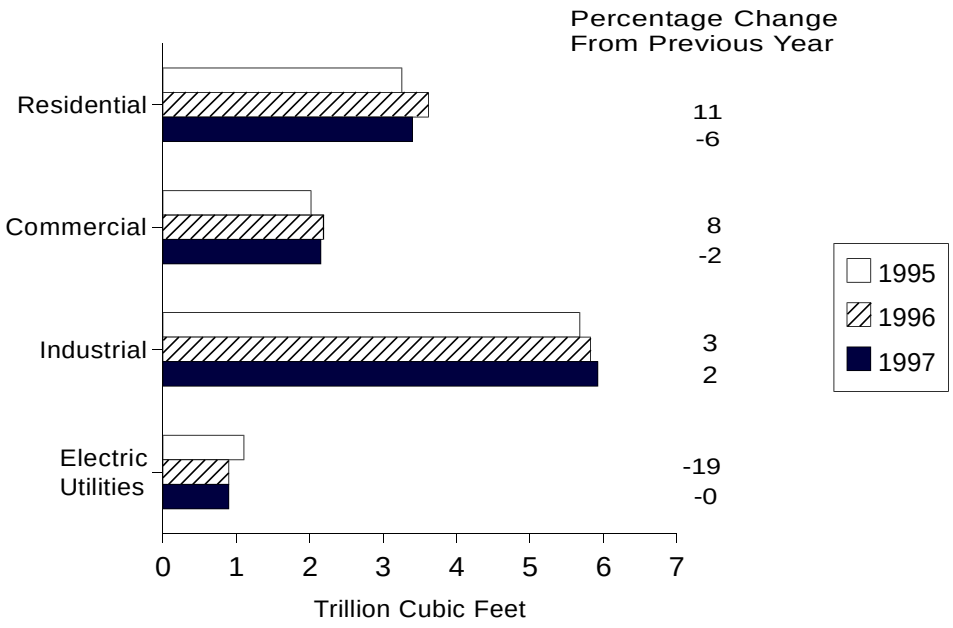
The average price of natural gas to residential users is estimated to be $6.80 per thousand cubic feet in May 1997, 4 percent higher than in April 1997, but almost equal to the price in May of last year. Residential prices in January and February 1997 were much higher than in 1996, resulting in a cumulative average price for January through May 1997 of $6.65 per thousand cubic feet--13 percent higher than in 1996.

Cumulative average natural gas prices in the commercial and industrial sectors are also higher in 1997 than in 1996, by 10 and 8 percent, respectively. But prices in both sectors fell somewhat from April to May 1997. The commercial price of natural gas is estimated to be $5.39 per thousand cubic feet in May 1997, 1 percent lower than in April. The onsystem industrial price is estimated to be $2.96 per thousand cubic feet, 2 percent lower than in April.

The most recent estimate of the price paid for natural gas by electric utilities is $2.30 per thousand cubic feet in April 1997. This equals the estimated price in March 1997, but is 14 percent below the price in April 1996. During 1996, the average monthly price of natural gas to electric utilities was significantly higher than it had been in 1995. In fact, the average price was 35 percent or more higher than in 1995 for 8 months of the year. This pattern seemed to continue in early 1997, as the price in January was 40 percent above that of January 1996. However, price estimates for both March and April 1997 are more than 10 percent below those of 1996. Thus, the cumulative average price for January through April 1997, of $2.81 per thousand cubic feet, is just below the average through April in 1996.

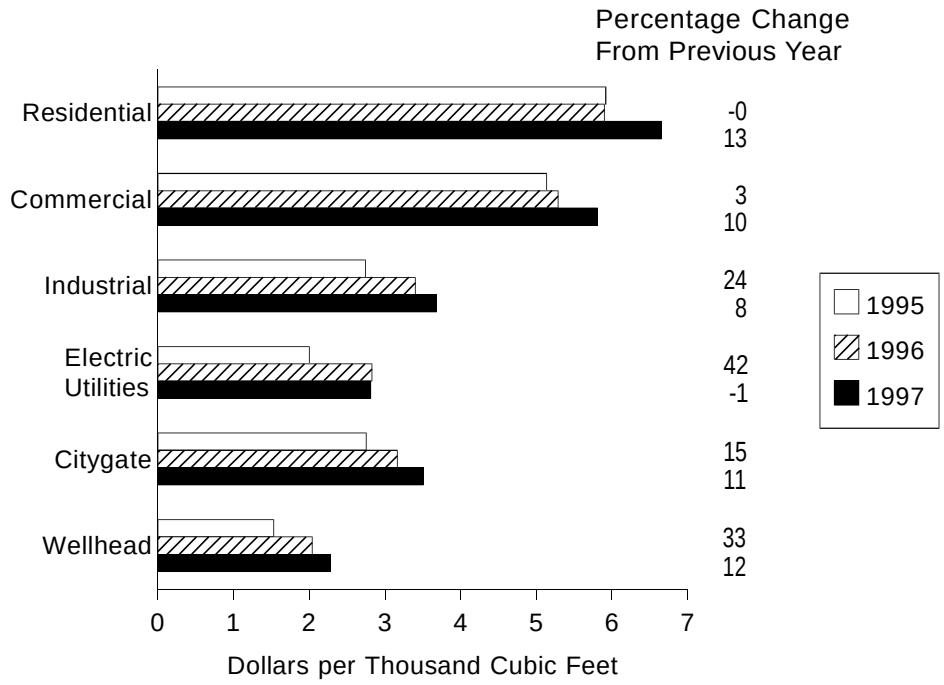
[1]End-use prices in the residential, commercial, and industrial sectors are for onsystem gas sales only. While monthly onsystem sales are nearly 100 percent of residential deliveries, in 1997 they have been 60 to 72 percent of commercial deliveries and only 16 to 18 percent of industrial deliveries (Table 4).

Figure HI3. Natural Gas Delivered to Consumers, January-August, 1995-1997



Note: The reporting of electric utility deliveries is 3 months behind the reporting of other deliveries.
Source: Table 3.

Figure HI4. Average Delivered and Wellhead Natural Gas Prices, January-May 1995-1997

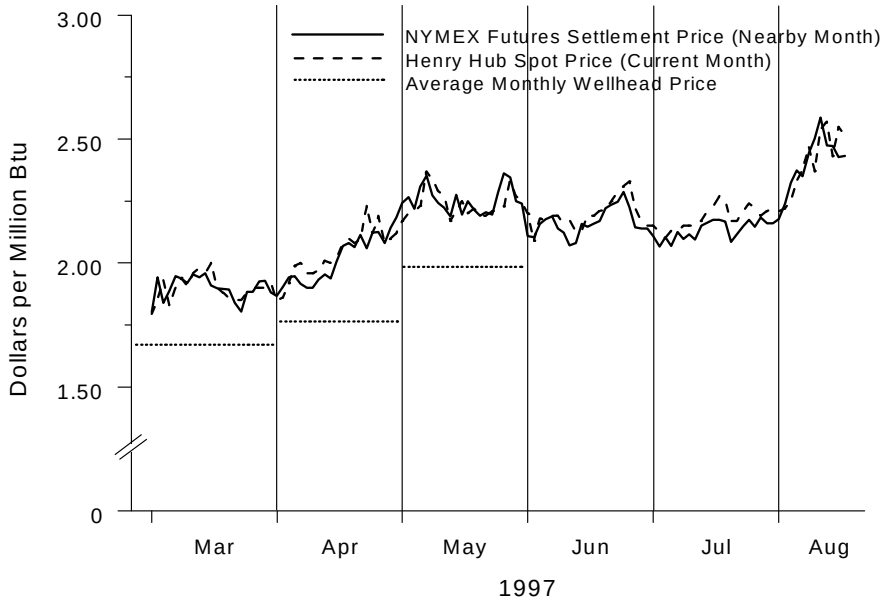


Note: Commercial and industrial average prices reflect onsystem sales only. The reporting of electric utility prices is 1 month behind the reporting of other prices..
Source: Table 4.

Information from the trade press shows that average spot prices and futures settlement prices (both at the Henry Hub) were fairly flat during June and July 1997, at a level slightly lower than in May (Figure HI5). However, after spending those 2 months near or below $2.20 per million Btu, both prices series have increased during the first half of August. The futures price for September delivery settled at $2.432 per million Btu on Friday, August 15, but had been $2.586 earlier that week. The average spot price at the Henry Hub was $2.52 per million Btu on August 15.

There seems to be no clear reason for the rise in these prices, given that relatively low storage injections during the summer lowered demand and the working gas level remains above that of last year. Also, there have been no severe weather effects or supply shortages to explain the spike.

Figure HI5. Futures and Spot Prices at the Henry Hub and Average Wellhead Price



Note: The futures price is for the contract that is to terminate trading next on the futures market. The spot price is the midpoint of the high and low daily prices at the Henry Hub.

Sources: **Futures Prices:** Commodity Futures Trading Commission, Division of Economic Analysis. **Spot Prices:** Pasha Publications, Inc., *Gas Daily*. **Wellhead Prices:** Table 4.

Table 1. Summary of Natural Gas Production in the United States, 1991-1997

(Billion Cubic Feet)

Year and Month	Gross Withdrawals	Repressuring	Nonhydrocarbon Gases Removed[a]	Vented and Flared	Marketed Production (Wet)	Extraction Loss[b]	Dry Gas Production[c]
1991 Total	21,750	2,772	276	170	18,532	835	17,698
1992 Total	22,132	2,973	280	168	18,712	872	17,840
1993 Total	22,726	3,103	414	227	18,982	886	18,095
1994 Total	23,581	3,231	412	228	19,710	889	18,821
1995							
January	2,043	311	34	21	1,677	78	1,599
February	1,822	276	30	20	1,495	70	1,426
March	2,026	314	32	20	1,660	77	1,582
April	1,945	287	32	21	1,604	75	1,530
May	1,997	291	33	24	1,649	77	1,572
June	1,910	264	31	28	1,587	74	1,513
July	1,960	264	31	26	1,639	76	1,563
August	1,965	284	30	22	1,628	76	1,552
September	1,914	276	33	25	1,581	74	1,507
October	1,988	319	34	25	1,610	75	1,535
November	2,045	331	33	24	1,657	77	1,580
December	2,128	348	35	26	1,719	80	1,639
Total	23,744	3,565	388	284	19,506	908	18,599
1996							
January	E2,083	E327	E31	E25	E1,700	79	1,621
February	E1,955	E310	E29	E23	E1,593	74	1,518
March	E2,064	E328	E30	E22	E1,684	78	1,605
April	E2,012	E305	E31	E23	E1,653	77	1,576
May	E2,001	E285	E30	E22	E1,665	78	1,588
June	E1,954	E291	E28	E19	E1,616	75	1,541
July	E2,009	E288	E31	E22	E1,668	78	1,590
August	E2,021	E299	E31	E22	E1,669	78	1,591
September	E1,971	E301	E29	E21	E1,620	75	1,544
October	E2,028	E324	E30	E21	E1,654	77	1,577
November	E2,041	E318	E29	E21	E1,673	78	1,595
December	E2,140	E331	E31	E22	E1,757	82	1,675
Total	E24,281	E3,708	E359	E263	E19,951	930	19,022
1997							
January	E2,086	E327	41	E21	E1,696	79	1,617
February	E1,896	E301	38	E18	E1,538	72	1,467
March	E2,073	E322	R43	E22	RE1,686	79	R1,608
April	RE1,981	RE296	R42	RE22	RE1,621	R76	R1,545
May	RE2,076	RE321	RE43	RE22	E1,691	E79	E1,612
June	RE1,996	RE306	RE42	RE21	E1,627	RE76	RE1,551
July(STIFS)	NA	NA	NA	NA	E1,684	E78	E1,606
August(STIFS)	NA	NA	NA	NA	E1,674	E78	E1,596
1997 YTD	NA	NA	NA	NA	E13,218	E616	E12,602
1996 YTD	E16,100	E2,434	E240	E178	E13,248	617	12,630
1995 YTD	15,667	2,291	254	183	12,939	602	12,337

[a] See Appendix A, Explanatory Note 1, for a discussion of data on Nonhydrocarbon Gases Removed.

[b] Extraction loss is only collected on an annual basis. Annually it is between 4 and 5 percent of marketed production. Monthly extraction loss is estimated from monthly marketed production by assuming that the preceding annual percentage remains constant for the next twelve months.

[c] Equal to marketed production (wet) minus extraction loss.

R = Revised Data.

E = Estimated Data.

RE = Revised Estimated Data.

NA = Not Available.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise indicated and contain estimates for selected States (see Table 7). Estimates for the most recent two months are derived from the Short-Term Integrated Forecasting System (STIFS). Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources: 1991-1994: Energy Information Administration (EIA), *Natural Gas Annual 1995*. January 1996 through current month: Form EIA-895, "Monthly Quantity of Natural Gas Report," STIFS, and EIA estimates. See Appendix A, Explanatory Notes 1, 3, and 6, for discussion of computation, estimating procedures, and revision policy.

Table 2. Supply and Disposition of Dry Natural Gas in the United States, 1991-1997

(Billion Cubic Feet)

Year and Month	Dry Gas Production	Supplemental Gaseous Fuels[a]	Net Imports	Net Storage Withdrawals[b]	Balancing Item[c]	Consumption[d]
1991 Total	17,698	113	1,644	80	-500	19,035
1992 Total	17,840	118	1,921	173	-508	19,544
1993 Total	18,095	119	2,210	-36	-110	20,279
1994 Total	18,821	111	2,462	-286	-400	20,708
1995						
January	1,599	12	240	613	-60	2,403
February	1,426	10	223	531	17	2,207
March	1,582	10	236	228	42	2,098
April	1,530	7	220	-51	74	1,780
May	1,572	8	216	-343	115	1,567
June	1,513	8	202	-380	52	1,395
July	1,563	8	208	-313	30	1,497
August	1,552	8	223	-212	-24	1,548
September	1,507	7	216	-321	-17	1,393
October	1,535	9	224	-210	-72	1,486
November	1,580	10	224	278	-206	1,886
December	1,639	12	256	595	-181	2,321
Total	18,599	110	2,687	415	-230	21,581
1996						
January	1,621	14	[R]249	[R]719	[R]-40	2,564
February	1,518	12	[R]221	[R]459	[R]115	2,325
March	1,605	12	[R]226	[R]332	[R]17	[R]2,193
April	1,576	11	[R]227	[R]-120	[R]134	1,826
May	1,588	8	[R]244	[R]-342	[R]75	1,572
June	1,541	[R]9	[R]214	[R]-391	[R]85	1,458
July	1,590	10	[R]222	[R]-384	[R]2	1,440
August	1,591	[R]9	[R]221	[R]-360	[R]15	1,476
September	1,544	9	[R]227	[R]-379	[R]-7	1,393
October	1,577	10	[R]236	[R]-214	[R]-82	1,526
November	1,595	12	[R]238	[R]269	[R]-211	1,903
December	1,675	12	[R]259	[R]385	[R]-79	2,252
Total	19,022	130	[R]2,784	[R]-29	[R]23	[R]21,929
1997						
January	1,617	12	[E]264	672	-42	2,525
February	1,467	11	[E]231	356	209	[R]2,274
March	[R]1,608	10	[E]243	156	[R]70	2,088
April	[R]1,545	9	[RE]227	-55	[R]64	[R]1,790
May	[E]1,612	[RE]9	[RE]239	-319	[R]57	[R]1,598
June	[RE]1,551	[RE]7	[RE]231	[R]-366	[RE]41	[E]1,465
July(STIFS)	[E]1,606	[E]10	[E]243	[RE]-307	[RE]-39	[RE]1,513
August(STIFS)	[E]1,596	[E]9	[E]243	[E]-333	[E]7	[E]1,522
1997 YTD	[E]12,602	[E]78	[E]1,920	[E]-196	[E]368	[E]14,774
1996 YTD	12,630	86	1,825	-90	403	14,854
1995 YTD	12,337	72	1,767	73	246	14,495

[a] Supplemental gaseous fuels data are only collected on an annual basis except for the Dakota Gasification Inc. coal gasification facility where they are gathered each month. The ratio of annual supplemental fuels (excluding Dakota Gasification Inc.) to the sum of dry gas production, net imports, and net withdrawals from storage is calculated. This ratio, which varies between .0026 and .0037, is applied to the monthly sum of these three elements. The Dakota Gasification Inc., monthly value is added to the result to produce the monthly supplemental fuels estimate.

[b] Monthly and annual data for 1991 through 1995 include underground storage and liquefied natural gas storage. Data for January 1996 forward include underground storage only. See Appendix A, Explanatory Note 7 for discussion of computation procedures.

[c] Represents quantities lost and imbalances in data due to differences among data sources. See Appendix A, Explanatory Note 9, for full discussion.

[d] Consists of pipeline fuel use, lease and plant fuel use, and deliveries to consuming sectors as shown in Table 3.

[R] = Revised Data.

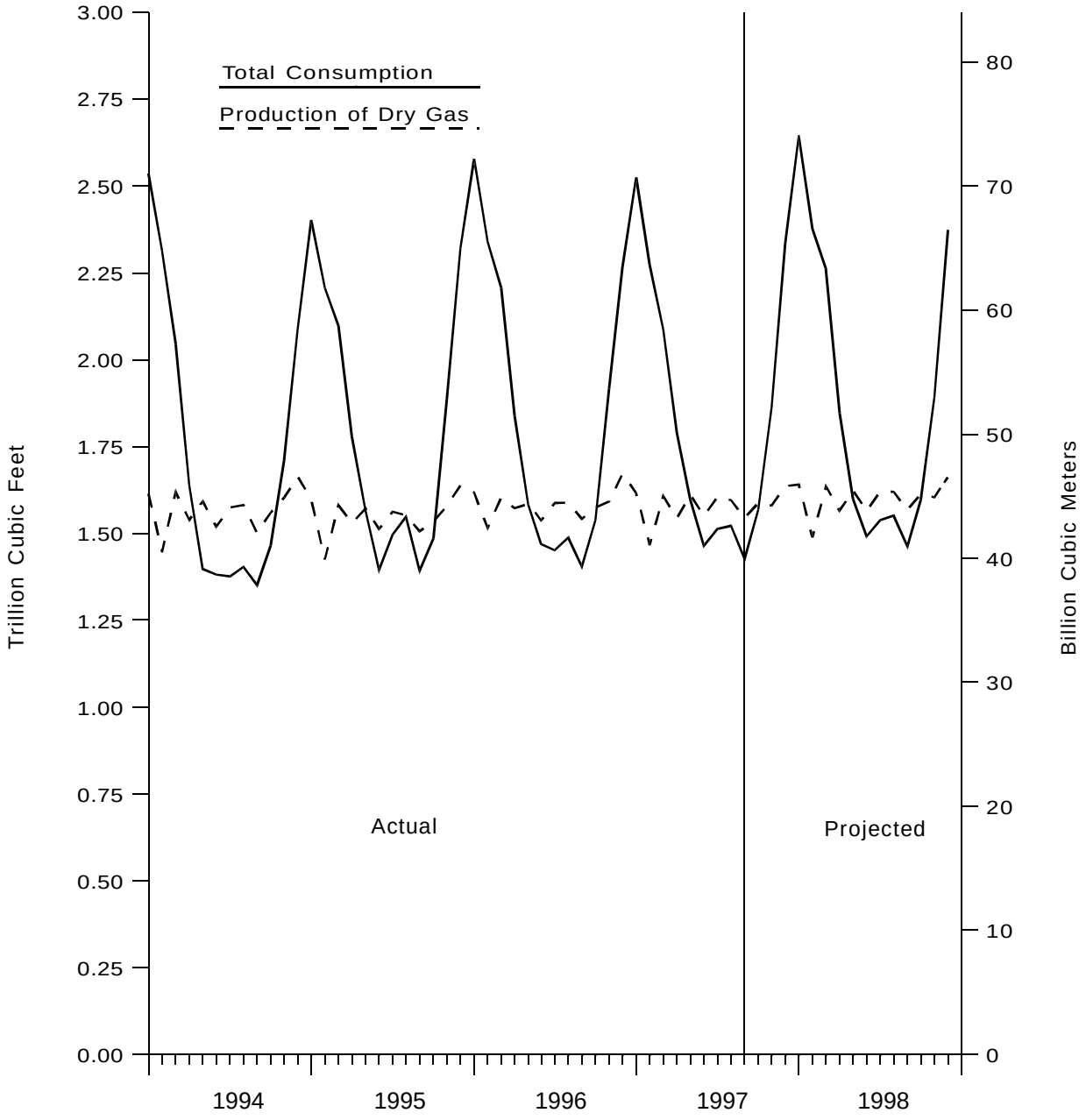
[E] = Estimated Data.

[RE] = Revised Estimated Data.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise indicated. Estimates for the most recent two months are derived from the Short-Term Integrated Forecasting System (STIFS). Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources: 1991-1994: Energy Information Administration (EIA), *Natural Gas Annual 1995,* 1994-1995: EIA: Form EIA-627, "Annual Quantity and Value of Natural Gas Report" (1995 data only), Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," Form EIA-191, "Underground Natural Gas Storage Report," Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas," Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," EIA computations and *Natural Gas Annual 1995.* January 1996 through current month: EIA, Form EIA-895, "Monthly Quantity of Natural Gas Report," Form EIA-857, Form EIA-191, EIA computations and estimates, Short-Term Integrated Forecasting System (STIFS) computations, and Office of Fossil Energy, U.S. Department of Energy, Natural Gas Imports and Exports. See Appendix A for dicussion of computation and estimation procedures and revision policies.

Figure 1. Production and Consumption of Natural Gas in the United States, 1994-1998



Sources: 1993 through the current month: Table 2. Projected data: Energy Information Administration, *Short-Term Energy Outlook* (October 1996).

Table 3. Natural Gas Consumption in the United States, 1991-1997

(Billion Cubic Feet)

Year and Month	Lease and Plant Fuel[a]	Pipeline Fuel[b]	Delivered to Consumers					Total Consumption
			Residential	Commercial	Industrial	Electric Utilities	Total	
1991 Total	1,129	601	4,556	2,729	7,231	2,789	17,305	19,035
1992 Total	1,171	588	4,690	2,803	7,527	2,766	17,786	19,544
1993 Total	1,172	624	4,956	2,863	7,981	2,682	18,483	20,279
1994 Total	1,124	685	4,848	[c]2,897	8,167	2,987	18,899	20,708
1995								
January	105	79	816	427	777	199	2,218	2,403
February	94	73	754	411	707	168	2,040	2,207
March	104	69	600	342	738	245	1,926	2,098
April	100	58	419	254	720	229	1,622	1,780
May	103	50	260	184	711	258	1,414	1,567
June	99	45	159	133	663	297	1,252	1,395
July	101	48	131	133	677	407	1,347	1,497
August	101	50	114	130	684	468	1,397	1,548
September	99	45	134	130	670	316	1,250	1,393
October	102	48	216	171	709	240	1,336	1,486
November	105	61	489	297	736	198	1,720	1,886
December	109	76	758	420	786	172	2,136	2,321
Total	1,220	700	4,850	[c]3,034	8,580	3,197	19,660	21,581
1996								
January	106	83	931	482	793	168	2,374	2,564
February	100	75	829	443	742	137	2,150	2,325
March	105	71	705	391	[R]764	156	[R]2,016	[R]2,193
April	103	59	474	287	734	170	1,664	1,826
May	104	51	270	188	694	264	1,417	1,572
June	101	47	162	138	710	299	1,310	1,458
July	104	47	125	129	678	358	1,289	1,440
August	104	48	118	128	711	367	1,324	1,476
September	101	45	137	130	694	285	1,247	1,393
October	104	50	243	177	[R]728	226	1,373	1,526
November	105	62	502	299	766	170	1,737	1,903
December	110	73	740	415	781	132	2,069	2,252
Total	1,249	712	5,234	[R]3,206	[R]8,796	2,732	[R]19,969	[R]21,929
1997								
January	106	82	909	480	808	139	2,336	2,525
February	96	74	768	426	767	143	[R]2,104	[R]2,274
March	106	68	602	357	766	189	1,914	2,088
April	[R]101	58	[R]436	272	730	193	[R]1,631	[R]1,790
May	[R]106	[R]52	[R]284	[R]204	[R]722	[R]231	1,440	[R]1,598
June(STIFS)	[E]101	[E]46	[E]157	[E]142	[E]708	NA	[E]1,318	[E]1,465
July(STIFS)	[E]104	[E]47	[E]125	[E]137	[E]707	NA	[RE]1,362	[RE]1,513
August(STIFS)	[E]108	[E]54	[E]114	[E]132	[E]717	NA	[E]1,360	[E]1,522
1997 YTD[d]	[E]828	[E]480	[E]3,395	[E]2,150	[E]5,924	894	[E]13,465	[E]14,774
1996 YTD	829	482	3,613	2,185	5,826	895	13,543	14,854
1995 YTD	807	471	3,253	2,014	5,678	1,099	13,216	14,495

[a] Plant fuel data are only collected on an annual basis and monthly lease fuel data are only collected annually. Lease and plant fuel estimates have been between 6 and 7 percent of marketed production annually. Monthly lease and plant fuel use is estimated from monthly marketed production by assuming that the preceding annual percentage remains constant for the next twelve months.

[b] Pipeline fuel use is only collected on an annual basis. Annually it is between 3 and 4 percent of total consumption. Monthly pipeline fuel data are estimated from monthly total consumption (excluding pipeline fuel) by assuming that the preceding annual percentage remains constant for the next twelve months.

[c] Total may not equal sum of the twelve months because gas volumes delivered for use as vehicle fuel are included in the annual total but not in the monthly components. Vehicle fuel deliveries were 1.7 billion cubic feet in 1994 and 2.7 billion cubic feet in 1995.

[d] Year-to-date volume represents months for which volume information is available in the current year.

[R] = Revised Data.

[E] = Estimated Data.

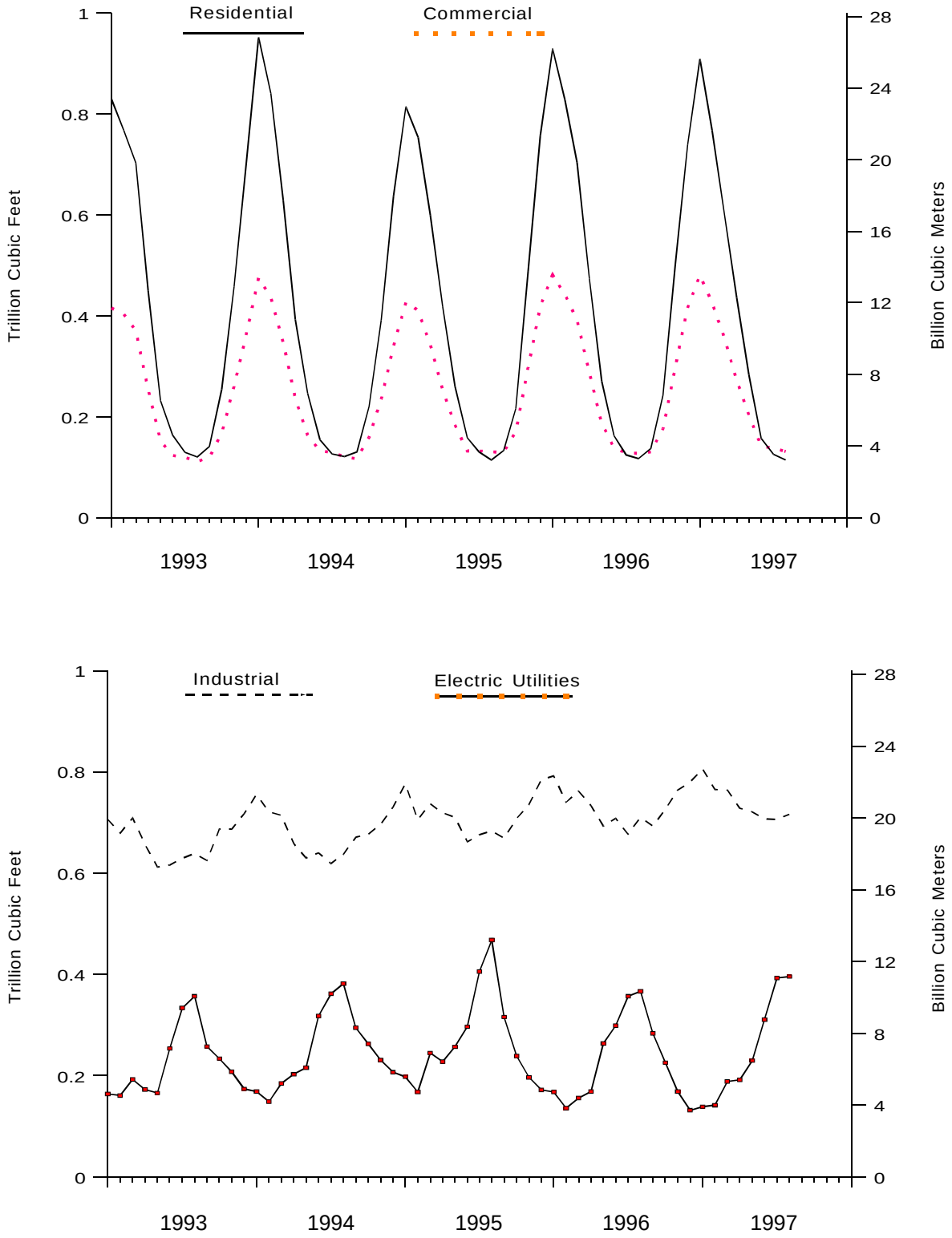
[RE] = Revised Estimated Data.

NA = Not Available.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise indicated. Estimates for the most recent three months are derived from the Short-Term Integrated Forecasting System (STIFS). Geographic coverage is the 50 States and the District of Columbia. Totals may not equal sum of components because of independent rounding.

Sources: 1991-1994: Energy Information Administration (EIA): Form EIA-627, "Annual Quantity and Value of Natural Gas Report," Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," Form EIA-759, "Monthly Power Plant Report," EIA computations, and *Natural Gas Annual 1995*. January 1996 through the current month: EIA: Form 895, "Monthly Quantity of Natural Gas Report," Form EIA-857, Form EIA-759, and STIFS computations. See Appendix A, Explanatory Note 5, for computation procedures and revision policy.

Figure 2. Natural Gas Deliveries to Consumers in the United States, 1993-1997



Sources: *Natural Gas Annual*, Form EIA-857, and Form EIA-759.

Table 4. Selected National Average Natural Gas Prices, 1991-1997

(Dollars per Thousand Cubic Feet)

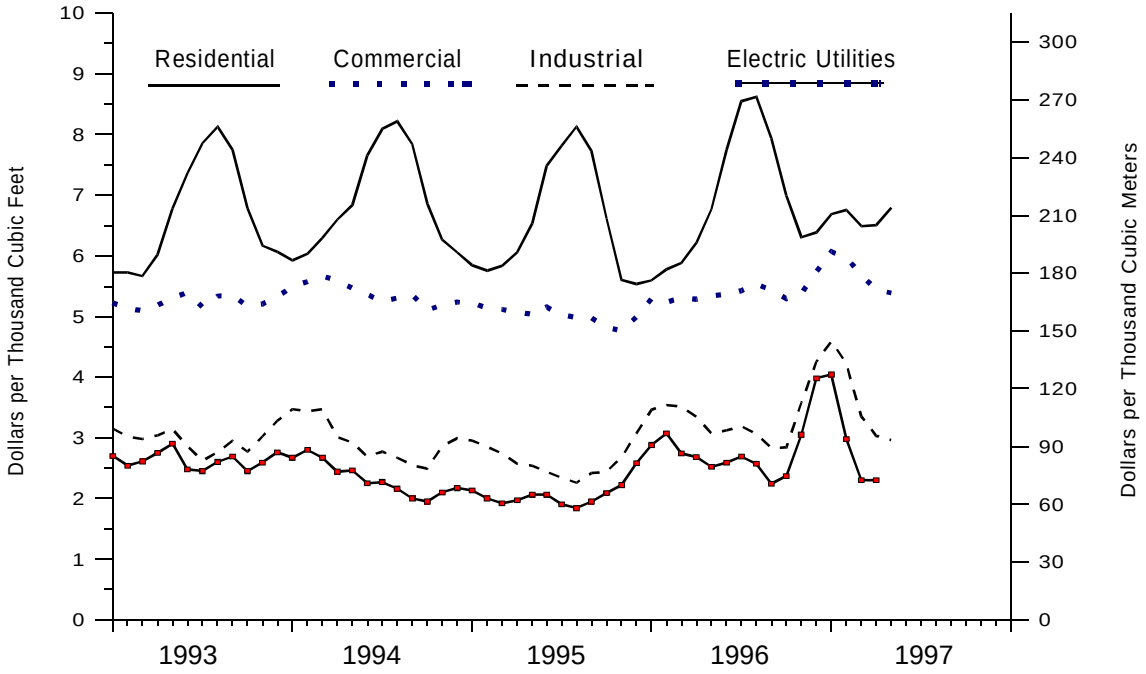
Year and Month	Wellhead Price[a]	City Gate Price	Delivered to Consumers					
			Residential Price	Commercial		Industrial		Electric Utilities Price
				Price	% of Total[b]	Price	% of Total[b]	
1991 Annual Average	1.64	2.90	5.82	4.81	85.1	2.69	32.7	2.18
1992 Annual Average	1.74	3.01	5.89	4.88	83.2	2.84	30.3	2.36
1993 Annual Average	2.04	3.21	6.16	5.22	83.9	3.07	29.7	2.61
1994 Annual Average	1.85	3.07	6.41	5.44	79.3	3.05	25.5	2.28
1995								
January	1.62	2.79	5.85	5.23	81.6	2.95	27.3	2.13
February	1.48	2.71	5.76	5.14	81.7	2.85	27.4	2.00
March	1.47	2.74	5.84	5.12	81.2	2.74	26.5	1.92
April	1.52	2.72	6.06	5.08	77.2	2.57	25.4	1.97
May	1.55	2.80	6.54	5.04	71.8	2.54	23.6	2.06
June	1.58	2.89	7.49	5.16	71.4	2.44	24.5	2.06
July	1.43	2.89	7.82	5.03	67.3	2.34	22.2	1.90
August	1.43	2.87	8.13	4.99	66.6	2.26	21.8	1.84
September	1.52	2.89	7.73	4.98	67.9	2.42	22.0	1.95
October	1.54	2.83	6.62	4.82	69.7	2.44	22.5	2.09
November	1.61	2.67	5.61	4.77	75.6	2.68	24.7	2.22
December	1.84	2.83	5.54	5.00	79.2	3.07	25.0	2.58
Annual Average	1.55	2.78	6.06	5.05	76.7	2.71	24.5	2.02
1996								
January	2.08	3.13	5.60	5.30	76.3	3.46	20.1	2.88
February	1.90	3.16	5.78	5.24	76.9	3.54	20.6	3.07
March	2.03	3.17	5.89	5.31	74.6	3.51	19.3	2.74
April	2.13	3.22	6.22	5.29	72.2	3.34	18.7	2.68
May	2.04	3.18	6.77	[R]5.35	66.8	3.07	17.3	2.52
June	2.13	3.39	7.75	5.37	62.4	3.12	15.6	2.59
July	2.33	3.48	8.55	5.43	60.6	3.19	17.2	2.69
August	2.19	3.48	8.62	5.54	58.7	3.06	14.8	2.57
September	1.87	3.03	7.94	5.44	58.9	2.83	14.6	2.24
October	1.93	2.93	7.00	5.30	62.0	[R]2.84	15.8	2.37
November	2.70	3.47	6.31	5.38	68.8	3.58	16.6	3.05
December	3.53	4.20	6.39	5.74	71.0	4.25	17.9	3.98
Annual Average	2.25	3.34	6.29	5.38	70.4	3.35	17.4	2.69
1997								
January	[E]3.46	4.26	6.69	6.07	72.0	4.59	17.8	4.04
February	[E]2.37	3.77	6.76	5.98	71.2	4.22	16.2	2.98
March	[E]1.72	3.05	6.49	5.69	68.6	3.35	16.4	2.30
April	[E]1.82	[R]2.65	6.51	5.45	[R]65.1	3.03	15.8	2.30
May	[E]2.04	3.15	6.80	5.39	59.8	2.96	15.5	NA
1997 YTD[c]	[E]2.28	3.50	6.65	5.81	68.6	3.68	16.4	2.81
1996 YTD	2.04	3.16	5.90	5.29	74.4	3.40	19.2	2.83
1995 YTD	1.53	2.75	5.92	5.14	79.7	2.74	25.7	2.00

[a] See Appendix A, Explanatory Note 8, of the *Natural Gas Monthly* (NGM) for discussion of wellhead prices.
[b] Percentage of total deliveries represented by onsystem sales, see Figure 6. See Table 24 for breakdown by State.
[c] Year-to-date price represents months for which price information is available in the current year.
[R] = Revised Data.
[E] = Estimated Data.
NA = Not Available.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia.

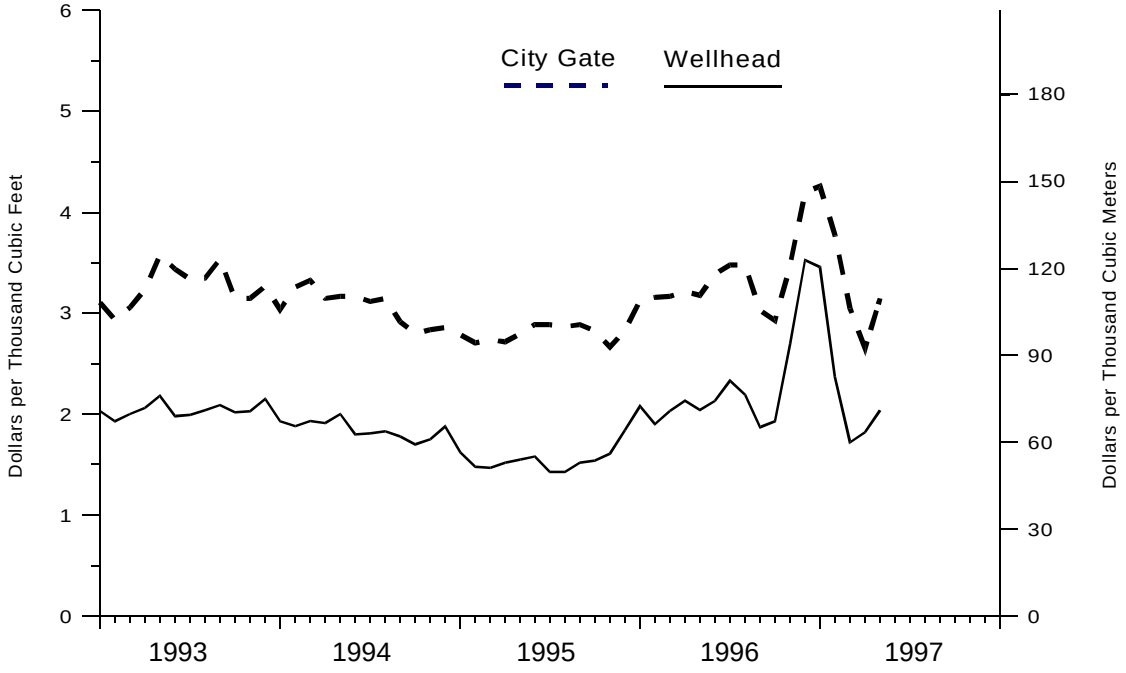
Sources: 1990-1994: Energy Information Administration (EIA) *Natural Gas Annual 1995.* 1994-1995 Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers," Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," and EIA estimates. January 1996 through current month: See Appendix A, Explanatory Note 8 for estimation procedures and revision policy.

Figure 3. Average Price of Natural Gas Delivered to Consumers in the United States, 1993-1997



Source: Table 4.

Figure 4. Average Price of Natural Gas in the United States, 1993-1997



Source: Table 4.

Table 5. U.S. Natural Gas Imports, by Country, 1991-1997

(Volumes in Million Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Pipeline				LNG				Total	
	Canada		Mexico		Algeria		Other			
	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price	Volume	Average Price
1991 Total	1,709,716	1.81	—	—	63,596	2.36	—	—	1,773,313	1.83
1992 Total	2,094,387	1.84	—	—	43,116	2.54	—	—	2,137,504	1.85
1993 Total	2,266,751	2.02	1,678	1.94	81,685	2.20	—	—	2,350,115	2.03
1994 Total	2,566,049	1.86	7,013	1.99	50,778	2.28	—	—	2,623,839	1.87
1995										
January	250,666	1.59	158	1.38	2,511	2.40	—	—	253,335	1.60
February	233,404	1.45	0	—	2,573	1.81	—	—	235,977	1.46
March	247,578	1.39	150	1.50	2,621	2.45	—	—	250,349	1.40
April	231,745	1.37	0	—	0	—	—	—	231,745	1.37
May	225,682	1.45	0	—	2,576	1.89	—	—	228,259	1.46
June	217,456	1.47	0	—	0	—	—	—	217,456	1.47
July	222,652	1.40	0	—	0	—	—	—	222,652	1.40
August	233,419	1.33	824	1.53	2,648	2.42	—	—	236,891	1.34
September	223,836	1.43	3,872	1.53	0	—	—	—	227,708	1.43
October	234,284	1.48	1,718	1.56	0	—	—	—	236,003	1.48
November	233,857	1.60	0	—	2,487	2.47	—	—	236,344	1.61
December	261,828	1.79	0	—	2,502	2.65	—	—	264,329	1.80
Total	2,816,408	1.48	6,722	1.53	17,918	2.30	—	—	2,841,048	1.49
1996										
January	R259,656	R2.08	R1,499	2.03	2,460	2.81	0	—	R263,615	R2.09
February	R230,546	R1.94	698	2.14	2,512	2.79	0	—	R233,756	R1.95
March	R237,668	R1.91	1,259	R2.34	2,599	3.06	0	—	R241,526	R1.92
April	R230,928	R1.86	R1,369	2.18	4,559	R2.43	0	—	R236,857	R1.87
May	R245,522	R1.70	R4,024	R2.14	2,612	2.58	0	—	R252,158	R1.72
June	R225,875	R1.70	R711	2.35	0	NA	0	—	R226,587	R1.70
July	R232,908	R1.82	R1,313	R2.58	2,642	3.00	0	—	R236,864	R1.84
August	R235,199	R1.80	R30	1.70	2,629	2.56	0	—	R237,858	R1.80
September	R234,206	R1.60	R770	1.69	0	NA	a2,524	3.34	R237,500	R1.62
October	R241,294	R1.68	1,110	R2.37	5,116	2.96	0	—	R247,520	R1.71
November	R245,795	R2.25	R982	2.85	5,031	R2.59	0	—	R251,807	R2.26
December	R263,681	R3.00	96	R3.30	5,164	R2.51	a2,425	3.57	R271,366	R3.00
Total	R2,883,277	R1.96	R13,862	R2.25	35,325	NA	4,949	3.45	R2,937,413	1.97
1997										
January	264,919	2.93	1,375	3.08	7,560	2.76	a2,417	3.68	276,271	2.93
February	233,569	2.49	2,248	2.44	7,667	2.99	0	—	243,484	2.51
March	254,416	2.10	2,737	1.84	2,530	2.98	0	—	259,683	2.11
April	R232,114	NA	E3,000	NA	2,557	NA	0	—	RE237,671	NA
May	RE238,860	NA	E4,000	NA	2,552	NA	b2,455	NA	RE247,868	NA
June	E231,570	NA	E3,500	NA	5,059	NA	0	—	E240,129	NA
1997 YTD	E1,455,448	NA	E16,860	NA	27,925	NA	4,872	NA	E1,505,106	NA
1996 YTD	1,364,339	1.86	9,626	2.15	14,743	NA	0	—	1,388,708	1.87
1995 YTD	1,406,532	1.45	308	1.44	10,281	2.14	—	—	1,417,121	1.46

[a] Received from the United Arab Emirates.
[b] Received from Australia.
R = Revised Data.
E = Estimated Data.
RE = Revised Estimated Data.
NA = Not Available.
— = Not Applicable.

Sources: 1991-1995: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." January 1995 through the current month (except estimates): Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports*. Estimated pipeline data (shown with an "E") are taken from data from the National Energy Board of Canada plus EIA estimates. LNG data: Industry reports.

Table 6. U.S. Natural Gas Exports, by Country, 1991-1997

(Volumes in Million Cubic Feet, Prices in Dollars per Thousand Cubic Feet)

Year and Month	Pipeline				LNG		Total	
	Canada		Mexico		Japan		Volume	Average Price
	Volume	Average Price	Volume	Average Price	Volume	Average Price		
1991 Total	14,791	1.91	60,448	1.76	54,005	3.71	129,244	2.59
1992 Total	67,777	1.83	95,973	1.90	52,532	3.43	216,282	2.25
1993 Total	44,518	2.14	39,676	2.02	55,989	3.34	140,183	2.59
1994 Total	52,556	2.42	46,500	1.68	62,682	3.18	161,738	2.50
1995								
January	2,518	2.00	5,576	1.54	5,541	3.35	13,635	2.36
February	2,016	2.02	5,542	1.32	5,557	3.38	13,115	2.30
March	2,387	1.92	6,670	1.36	5,573	3.39	14,630	2.22
April	2,457	1.84	5,941	1.49	3,741	3.47	12,138	2.17
May	1,931	2.01	6,848	1.58	3,698	3.54	12,477	2.23
June	2,106	1.91	7,945	1.59	5,556	3.59	15,606	2.34
July	2,446	1.82	6,526	1.39	5,581	3.58	14,552	2.30
August	2,558	1.77	3,431	1.29	7,531	3.47	13,520	2.60
September	3,336	2.03	2,378	1.47	5,656	3.36	11,370	2.58
October	2,929	1.91	5,588	1.63	3,733	3.30	12,250	2.21
November	1,627	2.21	3,535	1.65	7,518	3.29	12,679	2.69
December	1,244	2.43	1,303	1.82	5,599	3.31	8,146	2.94
Total	27,554	1.96	61,283	1.50	65,283	3.41	154,119	2.39
1996								
January	R7,044	R3.13	R1,607	1.98	5,534	3.38	R14,186	R3.10
February	R5,207	R2.71	2,000	1.82	R5,621	R3.35	R12,828	R2.85
March	R6,616	R2.79	R2,860	1.81	5,642	3.55	R15,118	R2.88
April	2,430	R2.21	1,924	1.69	R5,654	3.57	R10,008	2.88
May	2,809	2.15	R1,899	1.84	3,750	3.61	R8,458	R2.73
June	3,001	2.25	3,486	R2.16	5,651	3.65	12,138	2.87
July	R3,777	2.45	R3,062	R2.24	7,546	3.66	R14,385	3.04
August	2,197	2.30	9,176	2.11	R5,663	3.67	R17,036	2.65
September	2,514	1.94	2,389	1.73	R5,663	3.73	R10,566	2.85
October	R4,311	1.97	R1,990	1.85	R5,589	3.84	11,889	2.83
November	R6,776	R2.77	1,533	2.56	5,670	4.01	R13,979	3.25
December	R5,222	R3.67	R1,914	3.72	R5,665	3.73	R12,801	R3.70
Total	R51,905	2.67	R33,840	2.11	R67,648	R3.65	R153,393	R2.97
1997								
January	4,193	4.08	2,220	4.07	5,604	4.25	12,017	4.16
February	5,169	3.02	1,666	2.32	5,596	4.01	12,431	3.37
March	9,117	2.06	1,493	1.55	5,675	4.01	16,285	2.69
April	E4,000	NA	E1,400	NA	5,660	NA	E11,060	NA
May	E4,000	NA	E1,400	NA	3,812	NA	E9,212	NA
June	E4,000	NA	E1,400	NA	3,786	NA	E9,186	NA
1997 YTD	E30,479	NA	E9,579	NA	30,135	NA	E70,193	NA
1996 YTD	27,156	2.71	13,779	1.90	31,849	3.50	72,784	2.90
1995 YTD	13,414	1.95	38,522	1.49	29,666	3.45	81,602	2.27

R = Revised Data.
E = Estimated Data.
NA = Not Available.

Sources: 1991-1995: Energy Information Administration, Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." January 1995 through the current month (except estimates): Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports.* Estimated pipeline data (shown with an "E") are taken from data from the National Energy Board of Canada plus EIA estimates. LNG data: Industry reports.

Table 7. Marketed Production of Natural Gas, by State, 1991-1997

(Million Cubic Feet)

Year and Month	Alabama[b]	Alaska	Arizona	California	Colorado	Florida	Kansas
1991 Total	170,847	437,822	1,225	378,384	285,961	4,884	628,459
1992 Total	355,099	443,597	771	365,632	323,041	6,657	658,007
1993 Total	388,024	430,350	597	315,851	400,985	7,085	686,347
1994 Total	515,272	555,402	752	309,427	453,207	7,486	712,730
1995							
January	43,456	43,391	43	24,674	47,253	559	64,211
February	39,652	38,966	40	22,028	41,958	570	60,635
March	43,734	43,037	43	23,829	45,291	598	59,382
April	42,727	39,714	42	22,819	45,021	578	59,555
May	44,169	39,308	44	23,055	45,187	604	61,639
June	42,737	35,781	40	22,145	42,589	535	58,686
July	45,521	36,246	50	22,545	43,042	537	59,830
August	45,244	35,724	58	22,584	43,105	502	58,451
September	37,523	36,488	53	22,276	41,295	508	53,756
October	45,123	39,695	52	24,100	45,563	475	58,743
November	44,954	39,324	48	24,188	45,440	497	60,691
December	44,820	41,874	44	25,312	37,338	502	65,856
Total	519,661	469,550	558	279,555	523,084	6,463	721,436
1996							
January	32,816	44,811	41	20,482	44,982	518	62,504
February	30,858	40,581	42	22,766	40,221	493	62,213
March	33,269	43,896	45	24,525	46,594	460	62,554
April	31,604	39,838	36	23,836	41,542	456	60,401
May	32,749	36,479	39	23,932	45,656	483	61,727
June	31,136	37,470	45	23,137	40,521	503	55,896
July	30,947	37,404	30	24,356	37,626	500	56,667
August	31,157	37,379	43	24,405	38,378	540	54,730
September	30,030	38,181	31	23,683	44,665	537	55,147
October	30,029	41,339	34	24,090	48,808	468	57,158
November	31,598	40,859	37	24,307	49,394	517	58,021
December	32,684	44,325	40	24,998	50,578	531	60,434
Total	378,877	482,563	463	284,518	528,965	6,006	707,452
1997							
January	32,136	45,409	46	24,427	47,843	525	60,197
February	29,307	40,017	41	23,877	47,967	510	54,234
March	32,291	43,559	42	23,879	52,372	607	[R]60,099
April	32,077	[E]39,269	39	23,223	[E]50,469	819	57,085
1997 YTD	125,811	[E]168,254	168	95,406	[E]198,652	2,460	231,616
1996 YTD	128,547	169,126	164	91,609	173,339	1,927	247,672
1995 YTD	169,569	165,108	169	93,349	179,525	2,304	243,783

See footnotes at end of table.

Table 7. Marketed Production of Natural Gas, by State, 1991-1997

(Million Cubic Feet) — Continued

Year and Month	Louisiana[c]	Michigan	Mississippi	Montana	New Mexico	North Dakota	Oklahoma
1991 Total	5,034,361	195,749	108,031	51,999	1,038,284	53,479	2,153,852
1992 Total	4,914,300	194,815	91,697	53,867	1,268,863	54,883	2,017,356
1993 Total	4,991,138	204,635	80,695	54,528	1,409,429	59,851	2,049,942
1994 Total	5,169,705	222,657	63,448	50,416	1,557,689	57,805	1,934,864
1995							
January	437,237	22,536	7,664	4,919	134,508	4,284	160,707
February	386,483	7,882	6,874	4,278	125,334	3,933	143,517
March	417,303	31,418	7,651	4,716	136,983	4,410	154,640
April	411,156	17,507	7,408	4,381	131,657	4,111	148,305
May	432,964	19,427	8,138	4,153	137,827	4,313	149,369
June	412,412	25,052	7,836	3,420	130,688	4,186	143,346
July	432,943	23,349	7,959	3,493	132,372	3,615	145,565
August	420,784	19,129	8,685	3,570	138,073	4,128	145,609
September	422,232	21,698	8,783	3,734	134,030	4,129	143,565
October	401,813	19,548	8,429	4,345	139,330	4,239	156,378
November	452,671	15,086	7,874	4,566	140,166	4,019	156,667
December	480,368	15,569	8,233	4,690	144,869	4,101	164,066
Total	5,108,366	238,203	95,533	50,264	1,625,837	49,468	1,811,734
1996							
January	[E]457,580	22,482	8,089	4,503	[E]143,656	4,109	[E]160,437
February	[E]427,338	19,173	7,386	4,266	[E]133,884	3,753	[E]147,253
March	[E]448,513	11,499	8,385	4,443	[E]146,302	4,048	[E]154,752
April	[E]435,818	32,907	8,225	4,098	[E]140,455	3,924	[E]148,412
May	[E]452,471	18,490	9,026	4,244	[E]147,208	4,106	[E]149,174
June	[E]437,816	24,185	8,983	3,496	[E]139,613	3,847	[E]144,004
July	[E]460,981	27,825	9,335	3,603	[E]132,637	3,894	[E]145,901
August	[E]459,033	23,866	9,193	4,050	[E]134,516	4,066	[E]146,102
September	[E]448,022	20,734	8,641	4,172	[E]129,296	4,153	[E]143,935
October	[E]435,727	20,904	8,996	4,625	[E]130,917	4,268	[E]155,859
November	[E]470,333	16,612	8,487	[E]4,714	[E]131,772	4,134	[E]156,333
December	[E]494,812	13,930	8,518	[E]4,906	[E]136,236	4,178	[E]163,208
Total	[E]5,428,444	252,606	103,263	[E]51,119	[E]1,646,492	48,479	[E]1,815,370
1997							
January	[E]448,338	35,849	8,089	4,638	125,382	4,035	[E]150,892
February	[E]403,945	17,314	7,807	4,380	125,445	3,921	[E]139,315
March	[E]443,033	25,435	8,470	[E]4,609	[R]124,026	4,313	[E]148,412
April	[E]436,737	13,281	8,120	[E]4,320	123,657	4,176	[E]146,718
1997 YTD	[E]1,732,053	91,879	32,486	[E]17,948	498,511	16,445	[E]585,337
1996 YTD	[E]1,769,249	86,061	32,085	17,308	[E]564,297	15,833	[E]610,854
1995 YTD	1,652,178	79,343	29,597	18,293	528,482	16,738	607,170

See footnotes at end of table.

Table 7. Marketed Production of Natural Gas, by State, 1991-1997

(Million Cubic Feet) — Continued

Year and Month	Oregon	Texas[c]	Utah	Wyoming	Other[a] States	U.S. Total
1991 Total	2,741	6,280,654	144,817	776,528	784,362	18,532,439
1992 Total	2,580	6,145,862	171,293	842,576	800,913	18,711,808
1993 Total	4,003	6,249,624	225,401	634,957	788,472	18,981,915
1994 Total	3,221	6,353,844	270,858	696,018	774,724	19,709,525
1995						
January	279	528,857	22,354	62,919	66,793	1,676,643
February	214	479,553	21,686	50,369	61,412	1,495,384
March	208	538,515	25,813	57,602	64,520	1,659,694
April	150	523,631	24,529	59,544	61,326	1,604,162
May	137	539,311	22,498	54,039	62,505	1,648,688
June	135	526,759	15,626	51,792	63,229	1,586,994
July	150	548,617	17,120	55,403	61,116	1,639,474
August	139	545,415	17,676	57,125	62,212	1,628,213
September	128	520,687	18,447	51,741	59,787	1,580,857
October	128	524,049	16,987	57,494	63,766	1,610,256
November	126	522,744	18,062	56,956	62,910	1,656,989
December	130	531,909	20,493	58,792	70,151	1,719,118
Total	1,923	6,330,048	241,290	673,775	759,728	19,506,474
1996						
January	120	543,853	19,998	62,922	[E]66,547	[E]1,700,449
February	75	514,791	18,027	58,344	[E]61,145	[E]1,592,612
March	105	546,612	21,650	61,854	[E]64,094	[E]1,683,599
April	121	532,218	20,864	66,987	[E]60,873	[E]1,652,614
May	140	537,408	21,035	58,990	[E]61,783	[E]1,665,140
June	132	529,989	20,759	51,535	[E]62,926	[E]1,615,991
July	146	546,323	20,573	62,384	[E]67,056	[E]1,668,188
August	117	549,279	21,137	62,393	[E]68,607	[E]1,668,992
September	132	519,341	21,589	61,413	[E]65,879	[E]1,619,581
October	134	538,164	22,152	60,089	[E]70,267	[E]1,654,027
November	113	527,176	21,606	57,830	[E]69,602	[E]1,673,447
December	102	557,347	21,376	61,104	[E]77,463	[E]1,756,770
Total	1,439	6,442,501	250,767	725,845	[E]796,241	[E]19,951,409
1997						
January	105	560,683	21,782	53,272	[E]72,637	[E]1,696,286
February	98	509,089	19,115	45,143	[E]66,659	[E]1,538,182
March	101	560,042	21,912	62,872	[E]70,236	[RE]1,686,310
April	102	531,761	[E]21,255	60,661	[E]66,865	[E]1,620,636
1997 YTD	406	2,161,575	[E]84,063	221,947	[E]276,397	[E]6,541,414
1996 YTD	422	2,137,474	80,540	250,107	[E]252,658	[E]6,629,273
1995 YTD	851	2,070,557	94,382	230,434	254,051	6,435,884

[a] Includes Arkansas, Illinois, Indiana, Kentucky, Maryland, Missouri, Nebraska, Nevada, New York, Ohio, Pennsylvania, South Dakota, Tennessee, Virginia and West Virginia. The 1996 and 1997 monthly values for these States are estimated.

[b] The 1992, 1993, 1994, and 1995 monthly and annual values include Federal Offshore production.

[c] Monthly Federal offshore production volumes are included.

[R] = Revised Data.

[E] = Estimated Data.

[RE] = Revised Estimated Data.

Notes: Data for 1990 through 1995 are final. All other data are preliminary unless otherwise indicated. Totals may not equal sum of components because of independent rounding. See Appendix A, Explanatory Notes 1 and 3 for discussion of computation procedures and revision policy.

Sources: 1990-1993: Energy Information Administration (EIA), *Natural Gas Annual 1995* 1994 through current month: Form EIA-895, "Monthly Quantity of Natural Gas Report," Minerals Management Service reports, and EIA computations.

Table 8. Gross Withdrawals and Marketed Production of Natural Gas by State, April 1997

(Million Cubic Feet)

State	Gross Withdrawals			Repressuring	Nonhydrocarbon Gases Removed[a]	Vented and Flared	Marketed Production
	From Gas Wells	From Oil Wells	Total				
Alabama	35,677	1,008	36,684	2,096	2,364	147	32,077
Alaska	[E]15,012	[E]253,080	[E]268,092	[E]228,267	0	[E]556	[E]39,269
Arizona	34	5	40	0	0	0	39
California	6,715	25,805	32,520	9,165	89	43	23,223
Colorado	[E]43,355	[E]7,791	[E]51,146	[E]601	0	[E]76	[E]50,469
Florida	0	925	925	0	106	0	819
Kansas	50,371	6,869	57,240	97	0	57	57,085
Louisiana	[E]384,326	[E]57,775	[E]442,101	[E]3,467	0	[E]1,897	[E]436,737
Michigan	11,002	2,751	13,753	195	0	277	13,281
Mississippi	9,082	570	9,652	664	659	209	8,120
Montana	[E]3,836	[E]522	[E]4,358	[E]5	0	[E]33	[E]4,320
New Mexico	116,667	20,284	136,951	833	12,238	222	123,657
North Dakota	1,535	3,110	4,645	247	6	217	4,176
Oklahoma	[E]123,362	[E]23,356	[E]146,718	0	0	0	[E]146,718
Oregon	119	0	119	3	14	0	102
Texas	471,493	114,084	585,577	37,894	13,458	2,464	531,761
Utah	[E]19,832	[E]3,729	[E]23,561	[E]146	0	[E]2,161	[E]21,255
Wyoming	88,737	9,685	98,422	11,925	12,910	12,927	60,661
Other States	[E]64,367	[E]3,691	[E]68,057	[E]614	0	[E]578	[E]66,865
Total	[E]1,445,522	[E]535,040	[E]1,980,562	[E]296,219	[E]41,844	[E]21,863	[E]1,620,636

[a] See Appendix A, Explanatory Note 1, for a discussion of data on Nonhydrocarbon Gases Removed.
[E] = Estimated Data.
Notes: All monthly data are considered preliminary until publication of the Natural Gas Annual for that year. Totals may not equal sum of components because of independent rounding. See Appendix A, Explanatory Notes 1 and 3 for discussion of computation procedures and revision policy.
Source: Form EIA-895, "Monthly Quantity of Natural Gas Report."

Table 9. Underground Natural Gas Storage - All Operators, 1991-1997

(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change In Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net Withdrawals[c]
1991 Total[a]	3,954	2,824	6,778	-244	-8.0	2,608	2,689	80
1992 Total[a]	4,044	2,597	6,641	-227	-8.0	2,555	2,724	168
1993 Total[a]	4,327	2,322	6,649	-275	-10.6	2,760	2,717	-43
1994 Total[a]	4,360	2,606	6,966	284	12.2	2,796	2,508	-288
1995								
January	4,365	2,045	6,410	466	29.5	45	644	599
February	4,368	1,542	5,910	451	41.4	44	564	519
March	4,362	1,332	5,694	374	39.0	104	327	223
April	4,360	1,379	5,740	207	17.7	177	127	-49
May	4,393	1,668	6,061	114	7.3	369	34	-335
June	4,406	2,014	6,420	118	6.2	410	40	-371
July	4,340	2,301	6,641	28	1.2	359	54	-306
August	4,339	2,495	6,834	-112	-4.3	293	86	-207
September	4,341	2,802	7,143	-110	-3.8	343	29	-313
October	4,338	2,996	7,334	-79	-2.6	274	68	-205
November	4,342	2,728	7,070	-249	-8.4	96	367	272
December	4,349	2,153	6,503	-453	-17.4	53	635	582
Total	—	—	—	—	—	2,566	2,974	408
1996								
January	4,348	1,461	5,809	-584	-28.6	48	746	699
February	4,342	1,019	5,361	-522	-33.9	95	542	447
March	4,284	755	5,039	-577	-43.3	77	401	324
April	4,306	851	5,156	-529	-38.3	225	111	-114
May	4,325	1,158	5,483	-511	-30.6	371	43	-328
June	4,334	1,525	5,860	-489	-24.3	408	33	-375
July	4,329	1,893	6,223	-408	-17.7	415	46	-369
August	4,326	2,240	6,565	-255	-10.2	396	50	-345
September	4,331	2,597	6,928	-205	-7.3	393	29	-364
October	4,329	2,800	7,128	-196	-6.6	272	68	-204
November	4,333	2,544	6,878	-184	-6.8	88	351	264
December	4,335	2,170	6,505	17	0.8	85	461	376
Total	—	—	—	—	—	2,872	2,883	11
1997								
January	4,334	1,497	5,831	36	2.4	59	732	672
February	4,336	1,154	5,491	135	13.3	49	405	356
March	4,331	985	5,316	230	30.4	124	280	156
April	4,330	1,048	5,378	197	23.2	197	141	-55
May	4,329	1,357	5,686	199	17.2	357	37	-319
June	[R]4,342	[R]1,726	[R]6,068	[R]200	[R]13.1	404	39	[R]-366
July(STIFS)	[RE]4,342	[RE]2,033	[RE]6,375	[RE]139	[RE]7.4	NA	NA	[RE]-307
August(STIFS)	[E]4,342	[E]2,366	[E]6,708	[E]126	[E]5.6	NA	NA	[E]-333

[a] Total as of December 31.

[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1991 - 7,993; 1992 - 7,932; 1993 - 7,989; 1994 - 8,043; 1995 - 7,927; and 1996 - 8,159.

[c] Negative numbers indicate the volume of injections in excess of withdrawals. Positive numbers indicate the volume of withdrawals in excess of injections.

[R] = Revised Data.

[E] = Estimated Data.

[RE] = Revised Estimated Data.

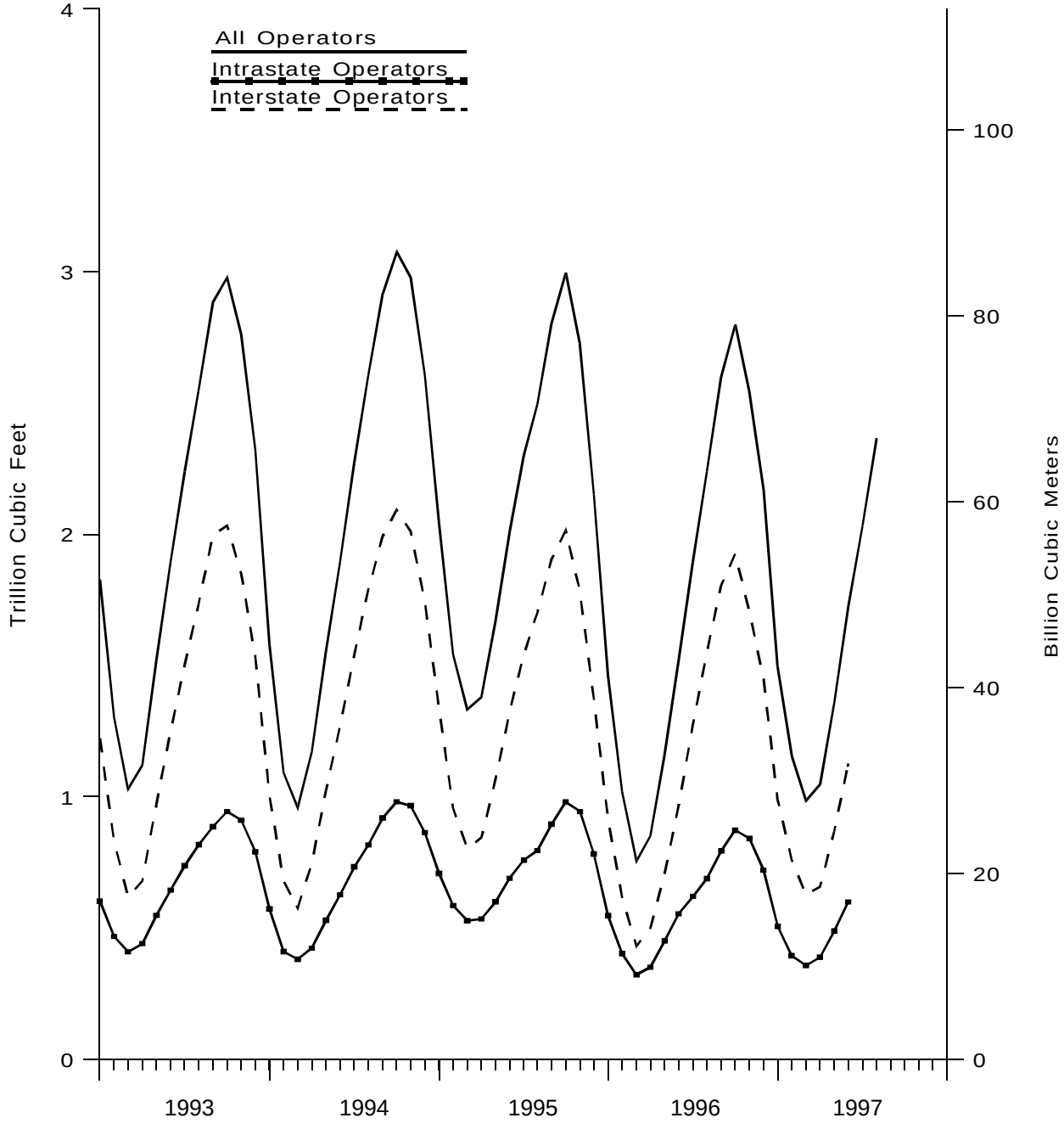
NA = Not Available.

— = Not Applicable.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise noted. Estimates for the most recent two months are derived from the Short-Term Integrated Forecasting System (STIFS). See Explanatory Note 7 of the *Natural Gas Monthly* for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.In January 1995, 2 billion cubic feet was added to base gas for two new respondents. Positive net withdrawals indicate the volume of withdrawals in excess of injections. Negative net withdrawals indicate the volume of injections in excess of withdrawals.

Sources: Form EIA-191, "Underground Natural Gas Storage Report," Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," and STIFS.

Figure 5. Underground Natural Gas Storage in the United States, 1993-1997



Sources: Energy Information Administration, Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers" and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Table 10. Underground Natural Gas Storage - Interstate Operators of Storage Fields, 1991-1997

(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net Withdrawals
1991 Total[a]	2,571	1,985	4,556	-218	-9.9	1,904	2,015	111
1992 Total[a]	2,652	1,819	4,471	-166	-8.4	1,838	1,940	102
1993 Total[a]	2,939	1,531	4,470	-288	-15.8	1,911	1,894	-17
1994 Total[a]	2,960	1,743	4,703	212	13.8	1,913	1,701	-213
1995								
January	2,957	1,336	4,293	330	32.8	27	449	422
February	2,958	956	3,914	276	40.6	20	404	384
March	2,955	804	3,759	228	39.6	66	225	159
April	2,954	845	3,799	97	13.0	122	78	-43
May	2,956	1,067	4,024	43	4.2	250	17	-233
June	2,962	1,324	4,287	55	4.3	292	23	-268
July	2,896	1,543	4,438	3	0.2	257	28	-229
August	2,893	1,700	4,593	-90	-5.0	208	45	-163
September	2,894	1,906	4,800	-86	-4.3	225	16	-209
October	2,891	2,016	4,907	-78	-3.7	162	48	-114
November	2,895	1,785	4,680	-226	-11.3	38	272	234
December	2,899	1,372	4,271	-371	-21.3	25	442	417
Total	—	—	—	—	—	1,692	2,048	356
1996								
January	2,897	913	3,810	-423	-31.7	23	483	460
February	2,894	617	3,511	-339	-35.5	60	359	299
March	2,855	432	3,287	-371	-46.2	44	269	225
April	2,868	500	3,368	-345	-40.8	152	73	-79
May	2,885	706	3,590	-362	-33.9	250	27	-223
June	2,893	971	3,864	-354	-26.7	286	16	-270
July	2,892	1,273	4,164	-270	-17.5	313	17	-296
August	2,889	1,551	4,440	-149	-8.8	291	14	-277
September	2,893	1,803	4,696	-103	-5.4	269	12	-257
October	2,893	1,927	4,820	-89	-4.4	170	46	-124
November	2,893	1,704	4,596	-81	-4.6	40	264	224
December	2,894	1,449	4,343	78	5.7	47	304	257
Total	—	—	—	—	—	1,946	1,884	-62
1997								
January	2,893	990	3,883	77	8.4	38	498	461
February	2,895	760	3,655	143	23.2	32	278	245
March	2,885	627	3,512	195	45.0	72	195	123
April	2,885	658	3,543	158	31.5	111	87	-24
May	2,884	869	3,753	163	23.1	234	20	-214
June	2,894	1,126	4,020	155	16.0	278	16	-262

[a] Total as of December 31.

[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1991 - 5,512; 1992 - 5,524; 1993 - 5,367; 1994 - 5,351; and 1995 - 5,314.

— = Not Applicable.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise noted. See Explanatory Note 7 of the *Natural Gas Monthly* for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia. Positive net withdrawals indicate the volume of withdrawals in excess of injections. Negative net withdrawals indicate the volume of injections in excess of withdrawals.

Sources: Form EIA-191, "Underground Natural Gas Storage Report," and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Table 11. Underground Natural Gas Storage - Intrastate Operators and Independent Producers, 1991-1997

(Volumes in Billion Cubic Feet)

Year and Month	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity		
	Base Gas	Working Gas	Total[b]	Volume	Percent	Injections	Withdrawals	Net Withdrawals
1991 Total[a]	1,383	839	2,221	-25	-2.9	705	674	-31
1992 Total[a]	1,392	778	2,170	-61	-7.3	717	784	67
1993 Total[a]	1,388	791	2,179	13	1.7	826	802	-24
1994 Total[a]	1,400	864	2,263	73	9.2	882	807	-75
1995								
January	1,409	709	2,118	136	23.7	17	195	177
February	1,410	586	1,995	175	42.6	24	160	136
March	1,407	528	1,935	146	38.2	38	102	64
April	1,406	535	1,941	111	26.1	55	49	-6
May	1,437	601	2,037	70	13.3	120	17	-103
June	1,443	690	2,133	63	10.0	119	16	-102
July	1,444	759	2,203	25	3.4	102	25	-77
August	1,446	795	2,241	-22	-2.7	85	41	-44
September	1,447	896	2,343	-24	-2.6	118	14	-104
October	1,446	980	2,427	-1	-0.1	112	20	-91
November	1,447	944	2,390	-23	-2.4	57	95	38
December	1,450	782	2,232	-82	-9.5	28	192	165
Total	—	—	—	—	—	874	926	52
1996								
January	1,451	548	1,999	-161	-22.7	24	263	239
February	1,448	403	1,851	-183	-31.2	34	183	148
March	1,429	323	1,752	-205	-38.8	33	133	99
April	1,438	351	1,788	-184	-34.4	73	39	-34
May	1,440	452	1,892	-149	-24.8	121	17	-104
June	1,441	555	1,996	-135	-19.6	122	17	-105
July	1,438	621	2,058	-138	-18.2	102	29	-73
August	1,437	689	2,126	-106	-13.3	104	36	-69
September	1,438	794	2,232	-102	-11.4	124	17	-107
October	1,436	873	2,308	-108	-11.0	102	22	-80
November	1,441	841	2,282	-103	-10.9	48	87	39
December	1,441	721	2,162	-61	-7.8	39	157	119
Total	—	—	—	—	—	926	999	73
1997								
January	1,441	507	1,948	-41	-7.5	22	234	212
February	1,441	395	1,836	-8	-1.9	17	128	111
March	1,446	358	1,804	35	10.8	53	85	33
April	1,445	390	1,835	40	11.3	85	54	-31
May	1,445	489	1,933	36	8.0	123	18	-105
June	1,448	600	2,048	45	8.1	126	23	-104

[a] Total as of December 31.

[b] Total underground storage capacity at the end of each calendar year (in billion cubic feet): 1991 - 2,481; 1992 - 2,407; 1993 - 2,621; 1994 - 2,692.; and 1995 - 2,613.

— = Not Applicable.

Notes: Data for 1991 through 1995 are final. All other data are preliminary unless otherwise noted. See Explanatory Note 7 of the *Natural Gas Monthly* for discussion of revision policy. Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia. Positive net withdrawals indicate the volume of withdrawals in excess of injections. Negative net withdrawals indicate the volume of injections in excess of withdrawals.

Sources: Form EIA-191, "Underground Natural Gas Storage Report," and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Table 12. Net Withdrawals from Underground Storage, by State, 1995-1997

(Volumes in Million Cubic Feet)

State	1997					
	June	May	April	March	February	January
Alabama	-93	-271	-130	-25	184	531
Arkansas	-1,340	-608	178	342	1,006	1,978
California	-23,191	-24,048	-19,220	-442	19,742	38,477
Colorado	-5,241	-5,328	5,569	2,069	4,862	5,523
Illinois	-29,099	-24,940	2,165	23,189	39,781	63,857
Indiana	-1,908	-110	1,444	2,498	2,866	7,273
Iowa	-8,361	-3,473	1,359	2,953	8,469	15,926
Kansas	-12,143	-9,678	-1,509	3,832	8,745	13,031
Kentucky	-8,640	-7,482	-349	4,047	7,810	17,627
Louisiana	-20,118	-19,091	-4,291	-17,898	20,365	45,668
Maryland	-1,657	-1,590	133	1,903	2,662	5,873
Michigan	-72,866	-46,356	-13,892	53,222	70,696	119,686
Minnesota	-312	-273	-31	188	117	588
Mississippi	-3,812	-5,552	442	-2,306	2,924	12,169
Missouri	-112	-1,200	56	1,174	-252	1,126
Montana	-1,633	-846	1,810	2,591	3,983	5,608
Nebraska	-841	-708	-43	-241	504	867
New Mexico	-534	-1,228	583	501	1,527	591
New York	-10,571	-7,727	-1,691	9,133	10,041	17,495
Ohio	-37,315	-33,899	-1,438	21,557	28,120	58,528
Oklahoma	-8,028	-18,258	-7,517	-8,092	8,255	27,666
Oregon	-1,602	-1,239	543	920	1,078	1,341
Pennsylvania	-49,410	-44,234	-3,299	50,202	52,191	94,224
Texas	-20,983	-26,009	-15,614	-20,402	24,285	48,252
Utah	-7,950	-4,255	-2,150	-2,620	2,520	8,931
Washington	-3,766	-5,880	-66	3,217	1,798	1,587
West Virginia	-31,691	-23,964	1,715	23,312	28,900	53,643
Wyoming	-2,290	-1,119	127	1,082	2,976	4,361
Total	-365,507	-319,364	-55,115	155,907	356,154	672,425

See footnotes at end of table.

Table 12. Net Withdrawals from Underground Storage, by State, 1995-1997

(Volumes in Million Cubic Feet) — Continued

State	1996						
	Total	December	November	October	September	August	July
Alabama	-1,224	761	129	-117	-440	-395	-205
Arkansas	64	644	562	-603	-1,153	-615	-744
California	49,108	15,529	-3,042	-6,542	-6,976	15,137	6,837
Colorado	-414	2,998	130	-36	-3,793	-3,703	-5,336
Illinois	-15,745	35,297	15,621	-28,518	-36,920	-35,442	-35,741
Indiana	-1,644	3,270	-734	-2,706	-3,932	-6,158	-4,335
Iowa	-293	18,525	5,704	-10,667	-12,673	-13,268	-12,464
Kansas	18,232	13,179	13,662	-5,835	-8,542	-8,116	-7,168
Kentucky	-7,269	8,090	4,872	-2,825	-8,596	-10,080	-13,360
Louisiana	14,718	32,188	29,787	-13,921	-32,347	-32,118	-28,952
Maryland	-1,808	787	1,274	-1,580	-1,699	-1,869	-1,912
Michigan	-36,637	82,503	60,584	-50,388	-79,575	-82,659	-80,378
Minnesota	40	228	31	-33	-202	-210	-287
Mississippi	-12,715	4,664	5,736	-3,365	-7,335	-7,882	-8,093
Missouri	-67	74	305	-210	-204	-206	-240
Montana	11,680	5,505	4,755	336	-3,519	-3,502	-3,261
Nebraska	-1,391	1,055	457	572	-744	-1,277	-1,132
New Mexico	5,137	-856	552	488	-1,850	366	812
New York	-13,453	8,062	6,286	-2,599	-7,346	-12,590	-12,965
Ohio	-10,813	34,940	25,546	-13,626	-23,686	-29,401	-35,840
Oklahoma	26,130	21,887	17,277	-11,668	-18,436	-14,723	-7,777
Oregon	1,405	1,240	552	207	-104	-437	-1,133
Pennsylvania	-58,979	25,007	33,479	-15,457	-37,736	-52,148	-69,635
Texas	61,749	24,219	12,159	-22,471	-34,375	-17,650	-2,753
Utah	12,955	9,164	4,651	1,416	-2,204	-3,884	-6,821
Washington	2,015	1,739	456	1,642	-599	-1,966	-936
West Virginia	-34,526	21,796	19,966	-15,212	-28,076	-19,867	-32,607
Wyoming	5,056	3,529	2,903	-272	-613	-771	-2,160
Total	11,311	376,021	263,660	-203,992	-363,677	-345,434	-368,585

See footnotes at end of table.

Table 12. Net Withdrawals from Underground Storage, by State, 1995-1997

(Volumes in Million Cubic Feet) — Continued

State	1996						1995
	June	May	April	March	February	January	Total
Alabama	-670	-367	-153	162	17	54	73
Arkansas	-1,166	-1,302	-44	1,259	1,115	2,112	709
California	-9,894	-23,726	-12,087	1,292	25,281	47,300	-27,358
Colorado	-5,026	-2,247	1,308	5,105	1,486	8,699	-3,152
Illinois	-32,391	-27,002	-3,163	23,029	41,246	68,239	22,981
Indiana	-2,421	-161	990	3,541	3,831	7,170	711
Iowa	-7,692	-1,625	2,012	6,372	8,820	16,663	6,443
Kansas	-12,110	-7,724	-5,531	10,743	7,491	28,184	4,875
Kentucky	-14,232	-6,228	395	7,956	12,252	14,488	7,178
Louisiana	-15,803	-12,312	-1,310	24,547	23,515	41,445	52,753
Maryland	-2,655	-2,189	71	1,500	2,677	3,787	4,049
Michigan	-79,051	-58,348	-14,604	51,244	82,900	131,134	117,409
Minnesota	-294	-366	-88	222	260	781	104
Mississippi	-6,681	-2,478	-4,093	6,048	3,026	7,739	7,783
Missouri	-261	-1,319	293	379	-100	1,423	-197
Montana	-3,578	780	645	3,877	3,437	6,207	3,599
Nebraska	-1,826	-1,535	-287	763	718	1,845	5,844
New Mexico	49	32	496	2,160	1,575	1,312	2,273
New York	-12,170	-13,343	-2,714	9,001	12,727	14,199	14,746
Ohio	-36,903	-29,890	-8,654	29,036	33,716	43,949	38,862
Oklahoma	-11,641	-18,357	-4,610	16,897	23,857	33,424	19,264
Oregon	-1,173	-723	132	651	940	1,252	-880
Pennsylvania	-62,217	-46,405	-22,349	43,702	64,404	80,378	63,786
Texas	-14,053	-28,106	-22,815	43,560	49,234	74,801	26,165
Utah	-6,742	-5,533	-188	2,388	8,372	12,335	-118
Washington	-3,317	-1,974	-359	536	762	6,031	-2,363
West Virginia	-29,512	-32,729	-16,154	27,054	30,565	40,250	41,129
Wyoming	-1,760	-2,704	-644	1,095	3,044	3,410	1,552
Total	-375,191	-327,881	-113,507	324,117	447,168	698,611	408,220

See footnotes at end of table.

Table 12. Net Withdrawals from Underground Storage, by State, 1995-1997

(Volumes in Million Cubic Feet) — Continued

State	1995						
	December	November	October	September	August	July	June
Alabama	400	189	73	-592	-218	-35	-42
Arkansas	2,149	618	80	-157	-1,390	-1,494	-1,312
California	25,933	-1,980	-18,197	-15,258	1,565	-13,534	-26,115
Colorado	5,194	-1,616	-1,296	-2,943	-4,401	-6,280	-6,269
Illinois	51,971	18,278	-38,814	-39,267	-39,596	-37,156	-35,273
Indiana	4,401	-844	-4,448	-4,766	-3,727	-2,861	-1,793
Iowa	17,220	12,827	-7,844	-13,599	-17,800	-12,204	-9,889
Kansas	16,419	7,352	-10,864	-16,412	-166	-4,798	-12,637
Kentucky	11,394	9,279	-2,526	-6,766	-3,846	-6,815	-7,626
Louisiana	46,245	24,216	-14,079	-23,381	-1,207	-20,851	-27,559
Maryland	3,350	689	-1,123	-2,041	-1,114	332	-2,042
Michigan	115,938	66,298	-32,377	-52,235	-54,249	-74,318	-65,350
Minnesota	245	2	-6	-241	-234	-306	-262
Mississippi	6,445	9,486	-2,596	-6,289	-740	-4,190	-1,631
Missouri	330	-165	-124	-463	-349	11	9
Montana	5,251	3,048	554	-1,096	-3,206	-2,917	-2,140
Nebraska	1,597	1,602	745	-385	-177	-278	-866
New Mexico	1,527	1,120	-20	-505	1,063	-41	-1,130
New York	17,605	9,671	-1,689	-8,910	-8,274	-7,285	-11,189
Ohio	43,090	24,176	-8,835	-18,579	-23,432	-30,964	-31,750
Oklahoma	24,431	8,327	-13,868	-7,816	2,877	-7,322	-14,113
Oregon	822	58	0	-486	0	-695	-1,034
Pennsylvania	78,025	45,269	-22,123	-44,608	-41,423	-35,648	-54,283
Texas	49,476	11,542	-9,871	-22,880	6,956	-3,685	-22,690
Utah	9,829	-1,367	-528	-1,489	-3,512	-7,217	-6,043
Washington	1,015	-67	100	-2,494	271	-1,413	-1,551
West Virginia	39,382	23,047	-14,545	-17,855	-8,978	-22,284	-24,564
Wyoming	2,100	768	-1,125	-1,841	-1,566	-1,580	-1,447
Total	581,782	271,826	-205,344	-313,356	-206,873	-305,827	-370,592

Notes: This table contains total net withdrawals for each State with natural gas storage facilities. Positive numbers indicate the volume of withdrawals in excess of injections. Negative values indicate the volume of injections in excess of withdrawals. Data for 1995 are final. All other data are preliminary at this time and are not considered final until publication of the *Natural Gas Annual* for that year.

Source: Form EIA-191, "Underground Natural Gas Storage Report."

Table 13. Activities of Underground Natural Gas Storage Operators, by State, June 1997

(Volumes in Million Cubic Feet)

State	Total Storage Capacity	Natural Gas in Underground Storage at End of Period			Change in Working Gas from Same Period Previous Year		Storage Activity	
		Base Gas	Working Gas	Total	Volume	Percent	Injections	Withdrawals
Alabama	3,280	1,190	923	2,113	-48	-5.0	161	68
Arkansas	31,871	11,379	4,029	15,408	1,305	47.9	1,374	34
California	469,696	247,419	148,507	395,926	-12,264	-7.6	24,991	1,800
Colorado	99,600	47,902	22,793	70,695	1,951	9.4	5,753	512
Illinois	898,239	651,467	127,551	779,018	8,775	7.4	29,905	806
Indiana	113,210	73,777	18,895	92,672	-122	-0.6	2,112	205
Iowa	270,200	200,700	19,866	220,566	7,826	65.0	8,389	28
Kansas	285,202	180,662	56,399	237,062	4,570	8.8	14,234	2,090
Kentucky	216,351	107,692	70,372	178,064	7,548	12.0	8,685	45
Louisiana	554,873	268,474	127,134	395,608	46,408	57.5	29,406	9,288
Maryland	62,000	46,677	5,604	52,281	-2,326	-29.3	1,657	0
Michigan	1,052,236	429,152	323,344	752,497	41,711	14.8	73,823	957
Minnesota	7,000	4,623	1,793	6,416	197	12.4	312	0
Mississippi	134,012	77,452	41,278	118,730	12,652	44.2	7,283	3,471
Missouri	31,126	21,600	8,200	29,800	-311	-3.7	121	9
Montana	375,010	167,385	46,463	213,848	-11,846	-20.3	2,428	796
Nebraska	39,469	31,507	2,412	33,919	1,606	199.3	923	82
New Mexico	96,600	26,021	4,658	30,679	440	10.4	1,339	805
New York	173,979	103,540	37,908	141,448	389	1.0	10,677	106
Ohio	557,452	350,723	87,159	437,882	4,118	5.0	37,975	660
Oklahoma	395,087	233,763	73,814	307,578	21,708	41.7	13,498	5,470
Oregon	11,623	4,896	3,926	8,822	-1,366	-25.8	1,602	0
Pennsylvania	680,006	357,018	198,133	555,151	17,053	9.4	50,504	1,094
Texas	672,534	253,731	160,963	414,693	47,408	41.7	30,408	9,426
Utah	121,980	62,100	22,994	85,094	2,109	10.1	8,422	472
Washington	37,300	22,096	12,918	35,015	2,858	28.4	3,816	50
West Virginia	484,597	298,582	83,434	382,016	5,547	7.1	31,994	303
Wyoming	105,869	60,774	14,040	74,814	-7,826	-35.8	2,293	4
Total	7,980,400	4,342,303	1,725,510	6,067,813	200,072	13.1	404,090	38,583

Notes: Gas in storage at the end of a reporting period may not equal the quantity derived by adding or subtracting net injections or withdrawals during the period to the quantity of gas in storage at the beginning of the period. This is due to changes in the quantities of native gas included in base gas and/or losses in base gas due to migration from storage reservoirs. Totals may not equal sum of components because of independent rounding. Geographic coverage is the 50 States and the District of Columbia.

Source: Form EIA-191, "Underground Natural Gas Storage Report."

Table 14. Natural Gas Deliveries to Residential Consumers, by State, 1995-1997

(Million Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997		
				May	April	March
Alabama	29,593	40,056	31,020	2,644	3,187	5,337
Alaska	7,600	8,779	8,410	789	1,177	1,207
Arizona	19,491	16,692	17,205	1,590	2,291	4,296
Arkansas	26,584	30,733	25,043	2,323	3,291	4,939
California	258,123	242,881	264,816	28,704	39,268	48,372
Colorado	NA	72,568	62,595	NA	NA	NA
Connecticut	24,678	28,252	25,149	2,332	4,378	5,176
Delaware	5,936	6,872	5,629	566	939	1,265
District of Columbia	9,672	11,406	9,731	944	1,316	2,049
Florida	7,343	10,166	8,249	863	975	1,277
Georgia	58,282	74,978	59,759	3,810	8,178	8,953
Hawaii	228	245	256	42	R41	45
Idaho	9,421	9,014	7,827	948	1,464	1,909
Illinois	297,871	318,851	280,863	26,062	41,163	61,373
Indiana	104,603	113,689	95,759	9,495	15,240	20,713
Iowa	49,878	66,662	47,185	3,937	6,970	9,526
Kansas	46,485	53,195	44,633	3,421	6,378	8,783
Kentucky	37,405	43,660	36,675	2,939	4,793	7,255
Louisiana	31,178	37,971	31,254	2,852	3,759	5,666
Maine	582	573	510	56	85	142
Maryland	NA	53,699	44,891	NA	NA	NA
Massachusetts	NA	73,350	65,544	6,900	12,092	15,090
Michigan	240,680	254,364	225,965	26,930	38,217	51,246
Minnesota	80,923	86,480	74,080	6,779	11,442	16,969
Mississippi	NA	20,382	16,771	NA	1,908	3,038
Missouri	81,745	137,955	78,066	6,467	11,006	15,404
Montana	NA	12,952	10,972	1,145	R1,995	2,468
Nebraska	NA	28,979	28,578	NA	4,505	6,232
Nevada	14,904	13,059	12,942	1,419	2,018	3,172
New Hampshire	4,319	4,465	4,018	465	744	913
New Jersey	124,448	137,499	116,091	10,361	18,139	29,262
New Mexico	20,555	19,061	16,017	1,978	1,524	3,862
New York	NA	252,440	231,558	NA	NA	NA
North Carolina	32,938	40,817	31,143	2,991	4,087	5,810
North Dakota	7,752	7,893	6,936	725	1,154	1,576
Ohio	217,352	230,323	210,263	21,542	32,974	44,087
Oklahoma	45,615	50,421	43,975	3,851	6,149	9,054
Oregon	20,641	19,695	17,135	1,920	3,206	4,350
Pennsylvania	161,487	174,752	156,115	15,615	24,995	33,554
Rhode Island	11,407	12,172	10,619	1,171	1,994	2,462
South Carolina	15,544	20,047	15,980	1,218	1,760	2,568
South Dakota	NA	8,603	7,553	NA	1,250	1,625
Tennessee	NA	46,883	36,779	2,994	4,757	NA
Texas	137,462	137,503	119,259	11,669	15,705	25,405
Utah	30,883	29,337	26,485	1,821	4,875	5,945
Vermont	1,689	1,674	1,459	189	283	383
Virginia	44,606	49,193	40,695	4,236	6,677	9,143
Washington	NA	36,529	31,076	3,888	R5,976	8,132
West Virginia	21,866	24,548	21,870	3,459	3,355	4,229
Wisconsin	NA	88,903	76,664	NA	11,637	16,912
Wyoming	NA	8,670	7,192	NA	NA	725
Total	2,999,412	3,208,446	2,849,259	283,881	R435,725	602,375

See footnotes at end of table.

Table 14. Natural Gas Deliveries to Residential Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1997		1996			
	February	January	Total	December	November	October
Alabama	9,116	9,309	56,666	6,687	3,421	1,652
Alaska	2,025	2,402	16,179	2,181	1,708	1,238
Arizona	5,250	6,063	28,056	4,101	2,351	1,096
Arkansas	7,749	8,281	46,354	6,294	3,773	1,427
California	66,682	75,096	473,940	62,990	43,757	30,502
Colorado	NA	NA	111,045	15,832	9,582	4,891
Connecticut	6,538	6,255	43,764	5,842	3,522	1,840
Delaware	1,614	1,552	9,809	1,180	628	294
District of Columbia	2,655	2,708	17,482	2,432	1,266	584
Florida	2,065	2,164	16,381	1,650	975	754
Georgia	15,912	21,429	126,338	18,438	14,572	5,740
Hawaii	49	51	537	44	41	39
Idaho	2,541	2,560	14,936	2,224	1,570	646
Illinois	69,290	99,983	537,535	80,827	63,646	28,056
Indiana	26,330	32,825	181,822	27,844	18,565	8,114
Iowa	11,879	17,565	87,818	14,101	9,753	3,606
Kansas	12,125	15,778	85,074	14,383	9,474	3,058
Kentucky	8,918	13,500	71,001	10,309	9,129	3,075
Louisiana	9,065	9,835	57,043	6,217	3,537	2,118
Maine	133	166	971	120	105	67
Maryland	NA	NA	85,401	11,460	7,816	3,674
Massachusetts	17,611	NA	114,318	13,940	10,012	5,047
Michigan	57,485	66,801	399,531	52,719	38,855	18,527
Minnesota	19,977	25,755	140,631	21,857	14,969	6,616
Mississippi	4,967	5,049	30,201	3,678	1,878	928
Missouri	23,399	25,469	137,214	20,538	11,686	4,321
Montana	3,037	3,893	22,602	3,351	2,511	1,306
Nebraska	7,830	9,536	46,714	7,347	4,079	2,192
Nevada	3,825	4,470	22,607	3,386	2,069	894
New Hampshire	1,136	1,061	7,015	855	667	312
New Jersey	34,709	31,977	215,617	29,469	18,609	9,747
New Mexico	5,739	7,451	35,932	6,025	3,925	1,415
New York	NA	NA	NA	NA	NA	NA
North Carolina	10,001	10,049	59,590	8,722	4,520	1,724
North Dakota	1,984	2,313	12,358	1,855	1,087	469
Ohio	52,418	66,331	375,884	52,532	38,603	18,996
Oklahoma	12,665	13,896	76,356	11,256	5,700	2,259
Oregon	5,308	5,857	33,224	5,198	3,163	1,357
Pennsylvania	41,308	46,015	275,013	37,266	25,929	12,899
Rhode Island	2,891	2,890	18,173	2,350	1,416	738
South Carolina	4,948	5,050	29,129	4,295	2,148	792
South Dakota	2,089	2,735	14,089	2,243	1,414	578
Tennessee	11,985	12,689	69,730	9,897	5,889	1,969
Texas	36,868	47,816	228,628	33,800	17,731	9,406
Utah	8,366	9,876	54,344	8,203	5,749	4,215
Vermont	416	419	2,523	302	208	100
Virginia	11,396	13,154	76,818	11,007	7,430	2,895
Washington	10,131	10,885	62,652	9,780	6,191	2,923
West Virginia	4,898	5,925	37,175	5,136	3,371	1,600
Wisconsin	19,840	26,187	147,984	21,279	16,720	7,304
Wyoming	955	1,150	14,755	1,901	1,454	1,185
Total	768,079	909,352	5,234,445	739,817	501,947	242,746

See footnotes at end of table.

Table 14. Natural Gas Deliveries to Residential Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996					
	September	August	July	June	May	April
Alabama	1,325	1,231	1,300	1,477	2,958	6,343
Alaska	589	544	493	647	964	1,424
Arizona	911	845	928	1,102	1,345	2,182
Arkansas	1,045	956	931	1,204	1,970	4,853
California	26,139	21,785	18,672	26,029	30,042	36,771
Colorado	2,776	2,508	2,872	4,320	6,909	11,539
Connecticut	992	954	1,088	1,274	2,303	4,399
Delaware	183	177	198	313	523	1,129
District of Columbia	405	384	417	588	816	1,731
Florida	691	659	741	787	1,016	1,640
Georgia	3,081	2,956	3,166	3,103	4,251	9,817
Hawaii	41	40	42	45	44	49
Idaho	363	277	300	542	976	1,314
Illinois	13,127	9,539	11,341	12,429	27,148	43,168
Indiana	3,509	3,115	3,268	4,511	8,914	16,810
Iowa	1,950	1,606	1,657	2,336	4,173	6,925
Kansas	1,994	1,623	1,786	1,739	3,050	6,272
Kentucky	1,418	1,276	1,129	1,331	2,278	5,612
Louisiana	1,900	1,835	1,832	1,980	2,579	5,193
Maine	28	23	25	29	53	81
Maryland	2,244	1,979	2,054	2,631	4,077	7,237
Massachusetts	2,696	2,480	2,834	3,958	7,621	11,645
Michigan	9,069	7,303	7,660	10,627	24,651	40,297
Minnesota	2,929	2,401	2,549	3,659	7,237	12,091
Mississippi	879	770	815	838	1,364	3,170
Missouri	2,749	2,447	2,687	3,404	6,251	13,132
Montana	648	439	470	753	1,438	2,087
Nebraska	974	884	937	1,373	2,434	4,435
Nevada	732	678	779	1,011	1,264	1,884
New Hampshire	169	155	159	233	429	698
New Jersey	4,811	4,634	5,016	5,832	10,716	20,214
New Mexico	898	889	1,727	1,812	654	2,763
New York	NA	NA	10,183	14,050	25,108	41,145
North Carolina	918	874	901	1,226	2,160	6,272
North Dakota	227	209	213	399	818	1,348
Ohio	7,156	6,423	7,343	10,325	17,688	34,545
Oklahoma	1,699	1,509	1,622	1,981	3,309	7,669
Oregon	820	673	838	1,386	2,299	2,820
Pennsylvania	5,623	5,275	5,597	7,833	13,620	25,579
Rhode Island	509	450	484	692	1,216	1,831
South Carolina	472	415	421	542	945	2,968
South Dakota	320	231	239	464	803	1,367
Tennessee	1,185	1,098	1,158	1,319	2,339	7,012
Texas	7,454	6,493	7,173	7,783	9,595	19,163
Utah	2,540	1,416	1,533	1,351	2,252	4,540
Vermont	56	47	51	85	167	268
Virginia	1,422	1,432	1,510	2,100	2,550	6,609
Washington	1,568	1,270	1,624	2,626	4,463	5,445
West Virginia	692	534	586	812	1,642	3,855
Wisconsin	3,129	2,859	2,947	4,584	8,023	12,785
Wyoming	401	289	298	556	1,005	1,409
Total	137,199	117,658	124,594	162,036	270,452	473,531

See footnotes at end of table.

Table 14. Natural Gas Deliveries to Residential Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996			1995		
	March	February	January	Total	December	November
Alabama	8,079	11,261	10,931	49,570	7,563	3,902
Alaska	1,918	2,419	2,054	15,231	2,294	1,411
Arizona	3,408	4,274	5,511	26,893	3,154	1,554
Arkansas	6,155	8,725	9,021	41,107	7,034	3,522
California	52,297	58,085	66,870	477,495	56,731	33,646
Colorado	14,701	17,499	17,616	104,286	12,262	8,830
Connecticut	6,245	7,147	8,159	40,824	6,389	3,449
Delaware	1,522	1,941	1,721	8,505	1,231	601
District of Columbia	2,402	3,117	3,339	15,690	2,579	1,246
Florida	2,062	2,575	2,832	14,540	1,785	1,004
Georgia	17,770	19,247	24,195	114,670	21,351	14,965
Hawaii	52	51	49	574	45	43
Idaho	1,847	2,509	2,368	13,003	1,748	1,364
Illinois	71,301	81,128	95,825	500,796	81,457	64,407
Indiana	24,959	28,883	33,330	161,059	26,875	18,305
Iowa	11,795	13,686	16,229	82,238	14,248	11,222
Kansas	11,160	13,709	16,827	75,846	13,608	6,757
Kentucky	10,268	11,352	13,824	66,149	12,325	9,224
Louisiana	7,557	10,352	11,944	52,603	7,401	4,391
Maine	137	143	159	913	151	97
Maryland	11,845	14,351	16,033	76,552	12,985	7,601
Massachusetts	16,649	18,583	18,852	105,795	15,933	9,090
Michigan	57,657	63,694	68,472	380,025	61,290	39,707
Minnesota	18,871	22,363	25,091	128,736	21,117	14,915
Mississippi	3,846	5,892	6,143	26,960	4,212	2,326
Missouri	18,851	24,496	26,652	125,110	19,696	11,325
Montana	2,701	3,568	3,330	19,640	2,697	2,248
Nebraska	6,165	8,165	7,729	45,054	6,188	4,132
Nevada	2,903	3,264	3,744	20,686	2,357	1,349
New Hampshire	998	1,147	1,193	6,507	991	550
New Jersey	30,417	35,838	40,315	194,432	33,195	18,422
New Mexico	3,300	4,941	7,581	28,770	4,649	3,027
New York	59,700	61,146	68,834	375,005	56,841	32,655
North Carolina	7,490	11,875	12,907	49,379	8,581	4,445
North Dakota	1,640	2,160	1,932	11,209	1,695	1,095
Ohio	54,282	58,678	69,313	357,754	59,871	40,926
Oklahoma	10,126	14,443	14,782	68,702	9,769	5,029
Oregon	4,041	5,584	5,046	28,067	3,952	2,620
Pennsylvania	39,695	45,391	50,305	262,126	44,456	27,801
Rhode Island	2,664	3,119	2,704	17,342	2,634	1,336
South Carolina	3,706	5,887	6,539	25,164	4,422	2,262
South Dakota	1,865	2,221	2,343	12,610	1,828	1,332
Tennessee	9,454	13,711	14,700	59,994	9,171	7,624
Texas	28,188	35,810	46,031	206,415	30,741	17,917
Utah	5,419	8,571	8,555	48,975	7,214	4,684
Vermont	354	418	467	2,299	353	176
Virginia	11,307	13,807	14,750	68,712	12,753	7,059
Washington	7,639	10,136	8,988	52,763	7,611	5,683
West Virginia	5,463	6,564	6,918	35,379	5,867	3,626
Wisconsin	20,340	22,584	25,431	136,012	22,980	16,784
Wyoming	1,703	2,373	2,182	12,152	NA	NA
Total	704,913	828,884	930,666	4,850,318	757,844	488,812

R = Revised Data.
NA = Not Available.

Notes: Geographic coverage is the 50 States and the District of Columbia. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 15. Natural Gas Deliveries to Commercial Consumers, by State, 1995-1997

(Million Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997		
				May	April	March
Alabama	15,116	17,655	14,586	2,020	2,194	2,614
Alaska	11,065	13,107	12,001	1,546	1,914	2,075
Arizona	15,452	14,450	14,327	2,160	2,589	3,184
Arkansas	16,832	19,045	15,398	1,654	2,173	3,150
California	115,852	101,884	129,783	19,032	21,134	23,659
Colorado	NA	41,403	38,649	NA	NA	NA
Connecticut	22,583	22,084	21,503	2,587	4,057	4,798
Delaware	3,876	4,257	3,487	417	601	844
District of Columbia	8,994	8,771	9,718	1,374	842	2,165
Florida	17,054	20,379	19,022	2,895	2,924	3,289
Georgia	28,483	34,724	29,024	3,181	4,116	4,822
Hawaii	895	930	933	166	R174	180
Idaho	6,690	6,596	5,886	696	1,043	1,348
Illinois	117,888	121,902	112,993	10,646	16,758	23,407
Indiana	56,323	55,007	46,750	9,923	7,578	10,420
Iowa	29,262	31,648	27,537	2,373	3,970	5,750
Kansas	27,864	31,258	25,682	2,610	3,702	6,104
Kentucky	21,606	24,084	21,011	1,885	2,868	4,081
Louisiana	14,983	14,850	12,583	1,496	1,854	3,678
Maine	1,541	1,496	1,350	152	231	378
Maryland	NA	27,855	25,165	NA	NA	NA
Massachusetts	NA	51,886	44,867	6,288	9,100	11,671
Michigan	118,988	121,556	110,537	13,197	19,197	25,640
Minnesota	54,619	57,298	50,575	5,166	8,379	12,027
Mississippi	NA	12,511	10,370	NA	1,563	2,372
Missouri	42,730	44,413	38,370	3,571	5,788	7,974
Montana	8,212	8,416	7,448	715	R1,343	1,652
Nebraska	NA	19,330	11,777	NA	NA	4,111
Nevada	11,411	10,107	9,900	1,676	1,907	2,456
New Hampshire	4,317	4,284	3,843	472	739	954
New Jersey	76,545	87,222	78,678	8,827	13,646	19,888
New Mexico	15,223	14,139	12,743	1,833	1,932	3,045
New York	NA	NA	121,128	NA	NA	NA
North Carolina	21,127	25,834	20,943	2,405	2,978	3,812
North Dakota	6,978	7,215	6,756	620	1,084	1,410
Ohio	110,543	115,564	102,240	11,335	15,184	23,197
Oklahoma	25,929	26,636	22,841	2,596	3,543	5,001
Oregon	14,662	14,084	12,428	1,575	2,306	3,078
Pennsylvania	82,966	92,419	78,130	10,055	12,817	17,923
Rhode Island	7,216	7,268	6,894	892	1,144	1,740
South Carolina	9,879	10,998	9,764	1,268	1,367	1,801
South Dakota	NA	6,677	6,119	NA	941	1,236
Tennessee	NA	33,542	28,043	3,219	4,246	NA
Texas	NA	109,453	100,166	NA	13,756	NA
Utah	16,894	16,122	14,620	1,273	2,685	3,376
Vermont	1,728	1,732	1,564	160	296	351
Virginia	33,833	31,959	30,714	4,368	5,744	7,209
Washington	NA	26,132	23,494	2,967	R4,581	5,641
West Virginia	21,627	17,562	13,783	3,006	8,310	2,807
Wisconsin	NA	54,899	46,521	NA	7,548	10,753
Wyoming	NA	7,935	5,995	NA	NA	915
Total	1,739,278	1,790,055	1,618,636	203,834	R272,424	356,895

See footnotes at end of table.

Table 15. Natural Gas Deliveries to Commercial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1997		1996			
	February	January	Total	December	November	October
Alabama	4,064	4,224	29,003	3,093	2,032	1,437
Alaska	2,488	3,042	24,990	2,873	2,405	2,016
Arizona	3,621	3,897	29,268	3,290	2,485	1,764
Arkansas	4,732	5,124	31,116	3,878	2,464	1,357
California	26,160	25,868	233,665	24,665	21,161	18,637
Colorado	NA	NA	69,252	9,071	5,821	3,431
Connecticut	5,347	5,794	39,730	4,900	3,110	2,397
Delaware	1,019	995	6,678	788	496	278
District of Columbia	2,299	2,314	16,219	2,322	1,190	798
Florida	3,841	4,104	41,667	3,972	3,162	2,942
Georgia	7,855	8,509	60,854	7,371	5,414	3,302
Hawaii	188	188	2,115	175	158	169
Idaho	1,786	1,817	11,526	1,625	1,110	598
Illinois	30,011	37,066	215,307	32,478	25,266	12,121
Indiana	12,753	15,648	91,872	13,655	9,723	4,238
Iowa	7,047	10,123	53,929	8,483	5,879	2,103
Kansas	8,255	7,193	58,010	9,333	4,839	2,000
Kentucky	5,467	7,305	41,343	5,934	4,493	2,261
Louisiana	3,593	4,362	25,960	2,458	1,696	1,405
Maine	348	433	2,566	310	280	172
Maryland	NA	NA	51,067	6,148	4,987	2,980
Massachusetts	13,903	NA	95,814	11,764	9,749	5,415
Michigan	28,395	32,559	204,406	26,447	19,774	9,695
Minnesota	13,432	15,614	96,799	14,546	10,462	5,093
Mississippi	2,853	3,278	22,724	2,376	1,753	1,111
Missouri	12,834	12,562	73,164	10,251	6,170	2,979
Montana	1,948	2,554	14,943	2,189	1,725	848
Nebraska	8,086	5,963	41,000	5,074	3,713	2,852
Nevada	2,644	2,727	19,969	2,388	1,778	1,236
New Hampshire	1,079	1,073	6,954	873	661	344
New Jersey	14,211	19,973	146,937	18,703	12,497	7,674
New Mexico	4,095	4,319	27,775	3,682	2,547	1,429
New York	NA	NA	NA	NA	NA	NA
North Carolina	5,861	6,070	41,811	5,435	3,340	1,979
North Dakota	1,881	1,984	12,098	1,746	1,103	562
Ohio	28,164	32,664	189,648	26,180	18,193	8,717
Oklahoma	7,126	7,663	43,285	5,760	3,100	1,721
Oregon	3,689	4,014	25,553	3,589	2,310	1,303
Pennsylvania	19,621	22,550	155,253	21,487	14,218	7,701
Rhode Island	1,745	1,695	11,734	1,286	969	643
South Carolina	2,667	2,776	R20,093	2,414	1,631	1,150
South Dakota	1,608	2,046	11,604	1,813	1,238	571
Tennessee	9,422	9,020	56,806	6,505	4,976	2,853
Texas	20,898	NA	NA	21,396	17,363	NA
Utah	4,490	5,070	29,544	4,228	3,191	2,077
Vermont	444	477	2,850	351	279	164
Virginia	7,878	8,636	58,649	7,512	5,771	3,373
Washington	—	7,492	48,167	6,633	4,495	2,705
West Virginia	R3,629	3,874	29,288	3,500	2,611	1,715
Wisconsin	12,679	16,328	94,566	13,530	11,157	4,538
Wyoming	883	995	17,081	3,889	2,457	1,395
Total	R425,899	480,227	R3,206,179	415,252	298,925	176,693

See footnotes at end of table.

Table 15. Natural Gas Deliveries to Commercial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996					
	September	August	July	June	May	April
Alabama	1,232	1,158	1,192	1,252	1,722	2,866
Alaska	1,368	1,177	1,125	1,247	1,558	2,084
Arizona	1,696	1,769	1,796	2,014	2,129	2,555
Arkansas	1,197	1,061	1,057	1,053	1,520	2,966
California	17,456	17,453	17,060	15,671	16,245	17,216
Colorado	2,224	2,141	2,393	3,057	4,431	6,997
Connecticut	1,817	1,711	1,967	1,745	2,247	3,528
Delaware	224	204	203	246	366	694
District of Columbia	768	746	800	824	1,233	1,893
Florida	2,827	2,703	2,822	3,015	3,321	3,899
Georgia	2,701	2,613	2,730	2,499	3,274	5,371
Hawaii	170	165	174	175	171	189
Idaho	422	355	347	479	711	996
Illinois	7,149	5,332	5,446	5,713	9,682	17,310
Indiana	2,602	2,440	2,307	2,789	4,497	7,988
Iowa	1,925	1,077	1,212	1,629	2,572	4,548
Kansas	1,300	3,762	3,530	1,989	3,232	4,911
Kentucky	1,224	1,150	1,059	1,080	1,544	3,341
Louisiana	1,327	1,332	1,277	1,511	1,682	2,401
Maine	78	75	74	82	132	208
Maryland	2,368	2,359	2,127	2,242	3,327	4,314
Massachusetts	4,783	4,272	3,744	4,200	6,576	8,952
Michigan	6,345	5,574	5,858	6,541	12,480	19,934
Minnesota	2,726	2,283	2,346	3,024	5,314	8,731
Mississippi	1,099	1,221	1,179	1,091	1,280	2,024
Missouri	2,251	2,375	2,307	2,395	3,583	6,656
Montana	499	375	386	508	861	1,330
Nebraska	2,345	2,556	3,631	1,499	1,958	3,223
Nevada	1,088	1,036	1,099	1,257	1,420	1,769
New Hampshire	196	186	172	237	399	654
New Jersey	5,325	5,490	5,454	5,697	8,016	14,342
New Mexico	1,140	1,457	1,514	1,721	1,549	2,569
New York	NA	NA	NA	NA	NA	NA
North Carolina	1,711	1,625	1,458	1,635	2,031	3,871
North Dakota	346	307	294	528	747	1,256
Ohio	4,129	4,490	4,662	7,635	8,922	16,758
Oklahoma	1,591	1,509	1,626	1,663	2,043	4,102
Oregon	1,021	904	966	1,302	1,781	2,056
Pennsylvania	4,297	5,633	4,271	5,389	7,903	13,699
Rhode Island	574	442	419	445	757	996
South Carolina	1,033	950	927	[R]990	[R]1,144	1,858
South Dakota	353	283	288	386	619	1,059
Tennessee	2,420	1,990	1,964	2,165	2,690	5,241
Texas	13,418	NA	15,399	15,909	18,409	21,434
Utah	1,282	876	906	894	1,354	2,475
Vermont	91	69	68	98	155	282
Virginia	2,464	2,085	2,571	2,998	3,407	5,062
Washington	1,923	1,696	1,859	2,669	3,430	4,143
West Virginia	1,250	1,331	1,393	1,141	1,596	2,573
Wisconsin	2,556	2,363	2,016	3,092	5,100	7,921
Wyoming	351	279	271	504	1,348	1,724
Total	130,465	127,875	128,795	[R]138,119	[R]187,601	286,572

See footnotes at end of table.

Table 15. Natural Gas Deliveries to Commercial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996			1995		
	March	February	January	Total	December	November
Alabama	3,714	4,775	4,529	26,232	3,502	2,177
Alaska	2,778	3,264	3,096	24,979	3,190	2,461
Arizona	3,012	3,136	3,620	28,329	2,802	2,056
Arkansas	3,897	5,251	5,414	27,411	4,311	2,265
California	21,546	23,078	23,477	279,606	26,152	22,818
Colorado	8,908	10,393	10,385	66,657	7,282	5,703
Connecticut	4,844	5,472	5,992	37,890	4,491	2,808
Delaware	889	1,186	1,104	5,743	851	417
District of Columbia	1,537	1,952	2,156	17,045	2,194	1,116
Florida	4,142	4,248	4,613	40,459	3,883	3,171
Georgia	7,474	8,401	9,702	56,538	8,062	5,706
Hawaii	182	190	198	2,199	177	178
Idaho	1,363	1,785	1,735	10,380	1,300	997
Illinois	26,484	32,431	35,894	203,833	30,734	22,408
Indiana	11,920	13,850	15,863	82,825	13,009	9,142
Iowa	7,047	8,289	9,164	50,329	8,170	5,952
Kansas	6,616	7,729	8,771	53,124	9,850	4,066
Kentucky	5,578	6,364	7,315	38,613	6,426	4,746
Louisiana	3,039	3,876	3,956	23,854	2,613	1,823
Maine	356	386	413	2,426	389	254
Maryland	5,753	6,627	7,835	46,924	7,538	4,871
Massachusetts	11,127	12,640	12,591	82,282	11,594	7,597
Michigan	28,197	30,779	32,781	194,105	29,922	19,742
Minnesota	12,796	13,776	15,703	90,684	13,839	10,937
Mississippi	2,607	3,404	3,581	20,171	2,627	1,693
Missouri	9,543	11,719	12,936	65,092	9,698	5,747
Montana	1,761	2,276	2,185	13,497	1,898	1,454
Nebraska	4,055	4,681	5,413	40,044	NA	NA
Nevada	2,219	2,262	2,418	18,812	1,871	1,444
New Hampshire	963	1,118	1,151	6,515	989	620
New Jersey	17,802	22,520	23,419	138,971	20,914	10,830
New Mexico	2,617	3,427	4,123	24,007	2,920	2,149
New York	NA	NA	NA	231,479	30,309	22,325
North Carolina	4,994	6,615	7,117	37,371	5,279	3,263
North Dakota	1,499	1,861	1,850	11,656	1,723	1,209
Ohio	26,529	29,596	33,837	175,347	27,649	18,650
Oklahoma	5,228	7,469	7,474	39,756	5,164	3,020
Oregon	2,895	3,900	3,526	22,437	2,837	2,010
Pennsylvania	20,751	23,598	26,306	143,744	22,596	19,918
Rhode Island	1,605	1,917	1,682	12,066	1,523	1,216
South Carolina	2,160	2,743	3,092	18,869	2,414	1,674
South Dakota	1,487	1,685	1,821	10,689	1,452	1,118
Tennessee	7,173	9,108	9,722	51,238	7,681	4,908
Texas	26,607	20,625	26,789	209,613	22,432	16,279
Utah	3,124	4,596	4,541	26,925	3,724	2,605
Vermont	384	449	462	2,672	410	242
Virginia	7,205	7,874	8,327	56,991	8,287	5,766
Washington	5,445	6,843	6,326	42,675	5,274	4,052
West Virginia	3,522	4,103	4,551	25,879	3,533	2,739
Wisconsin	12,341	13,930	16,022	84,920	13,817	10,676
Wyoming	1,465	1,714	1,685	9,849	NA	NA
Total	391,223	442,864	481,794	3,033,751	419,620	296,702

R = Revised Data.
NA = Not Available.
— = Not Applicable.

Notes: Geographic coverage is the 50 States and the District of Columbia. Deliveries for total year 1995 may not equal the sum of the twelve months. Gas volumes delivered for use as vehicle fuel are included in the annual total but not in the monthly components. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 16. Natural Gas Deliveries to Industrial Consumers, by State, 1995-1997

(Million Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997		
				May	April	March
Alabama	87,741	86,305	85,100	17,588	18,501	17,182
Alaska	32,593	29,617	20,190	5,619	6,443	6,993
Arizona	10,381	9,661	12,422	2,331	1,989	2,071
Arkansas	60,693	54,610	58,738	11,904	11,508	12,214
California	283,939	257,905	279,837	58,041	57,426	57,011
Colorado	NA	35,498	33,356	NA	NA	NA
Connecticut	15,819	13,248	15,015	2,870	3,308	3,521
Delaware	6,460	5,829	8,261	1,322	1,353	1,286
District of Columbia	0	0	0	0	0	0
Florida	61,406	57,758	56,219	12,696	12,641	11,944
Georgia	79,797	73,688	77,291	16,540	16,463	15,885
Hawaii	0	0	0	0	0	0
Idaho [a]	15,020	15,308	14,913	2,673	3,179	3,200
Illinois	149,315	158,925	143,960	25,127	26,548	29,745
Indiana	125,158	114,463	127,482	19,859	23,632	26,729
Iowa	47,938	50,034	48,392	8,519	9,085	9,804
Kansas	46,687	48,011	54,803	8,915	8,529	9,310
Kentucky	42,813	39,763	41,219	7,614	7,720	8,310
Louisiana	NA	429,368	443,134	NA	79,307	71,810
Maine	996	853	776	226	247	182
Maryland	NA	22,350	21,140	NA	NA	NA
Massachusetts	NA	41,045	47,086	8,359	10,356	10,484
Michigan	155,196	165,022	148,621	27,772	28,290	33,140
Minnesota	44,413	45,049	45,540	7,503	8,270	9,256
Mississippi	NA	33,291	37,103	NA	6,751	6,911
Missouri	34,190	33,991	31,875	4,994	7,198	5,107
Montana	8,348	7,523	7,656	1,365	R1,178	1,695
Nebraska	14,512	13,152	18,370	2,365	2,861	3,165
Nevada	13,016	13,274	12,454	2,791	2,424	2,665
New Hampshire	2,929	1,993	1,959	905	632	570
New Jersey	81,009	83,698	93,173	14,949	16,587	16,496
New Mexico	9,606	8,869	9,086	1,901	1,733	1,741
New York	NA	115,155	119,697	NA	NA	NA
North Carolina	49,664	40,940	44,403	9,678	10,552	10,332
North Dakota	5,103	3,002	2,982	847	780	1,417
Ohio	151,833	159,302	152,815	26,623	27,028	30,676
Oklahoma	89,391	84,474	83,128	17,315	17,287	17,159
Oregon	34,008	32,127	28,698	6,033	6,322	6,726
Pennsylvania	109,024	121,756	112,302	19,315	21,351	21,915
Rhode Island	11,279	11,215	14,793	2,401	2,514	2,241
South Carolina	43,351	36,056	41,618	9,041	9,177	9,070
South Dakota	NA	4,194	2,902	NA	624	705
Tennessee	NA	51,946	53,777	11,901	12,931	NA
Texas	896,491	900,739	787,723	171,636	167,280	189,847
Utah	18,673	18,094	19,794	3,633	3,757	3,777
Vermont	988	798	930	218	200	194
Virginia	34,250	35,925	35,087	7,375	6,382	4,118
Washington	NA	46,205	46,849	8,266	R7,968	9,259
West Virginia	20,226	21,794	22,426	7,107	1,811	2,640
Wisconsin	73,347	72,020	68,019	11,890	13,590	15,417
Wyoming	NA	18,299	20,209	NA	NA	NA
Total	3,792,243	3,727,283	3,653,321	722,057	R729,909	765,983

See footnotes at end of table.

Table 16. Natural Gas Deliveries to Industrial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1997		1996			
	February	January	Total	December	November	October
Alabama	16,628	17,842	205,175	17,247	17,651	18,646
Alaska	6,448	7,090	75,616	7,034	6,450	6,421
Arizona	1,949	2,041	25,726	2,555	2,304	2,361
Arkansas	12,093	12,974	122,324	11,396	12,010	12,470
California	55,950	55,512	681,527	63,374	61,298	59,429
Colorado	NA	NA	84,273	7,618	7,290	6,037
Connecticut	3,031	3,088	32,706	2,989	3,337	3,060
Delaware	1,220	1,279	14,268	1,213	1,218	1,338
District of Columbia	0	0	0	0	0	0
Florida	11,564	12,562	138,506	11,512	12,071	11,303
Georgia	16,131	14,779	179,015	15,597	15,990	15,321
Hawaii	0	0	0	0	0	0
Idaho [a]	2,802	3,166	34,573	2,890	2,747	3,023
Illinois	32,917	34,978	334,839	37,247	32,295	25,278
Indiana	25,623	29,314	290,093	24,424	25,343	24,136
Iowa	9,788	10,742	114,720	10,739	11,266	9,530
Kansas	8,069	11,864	130,980	9,681	11,581	8,438
Kentucky	8,859	10,309	94,470	9,695	8,841	7,704
Louisiana	NA	83,386	1,062,482	87,647	96,051	90,104
Maine	162	180	2,190	171	234	239
Maryland	NA	NA	50,614	5,002	4,046	4,261
Massachusetts	10,338	NA	99,801	9,345	8,613	9,307
Michigan	32,661	33,333	353,173	32,225	30,623	25,882
Minnesota	9,999	9,385	106,636	10,004	10,609	9,041
Mississippi	6,986	7,602	R82,557	6,764	6,812	R7,629
Missouri	9,633	7,259	69,929	6,394	6,018	4,833
Montana	2,197	1,913	17,362	1,850	1,545	1,502
Nebraska	3,087	3,033	29,199	3,063	2,596	2,612
Nevada	2,462	2,675	32,435	2,843	2,691	2,532
New Hampshire	411	411	4,979	391	527	486
New Jersey	15,694	17,283	206,196	25,326	16,937	16,252
New Mexico	1,897	2,335	20,665	1,995	1,699	1,622
New York	NA	NA	R271,622	24,948	24,861	21,118
North Carolina	9,942	9,160	106,381	8,860	10,882	10,781
North Dakota	1,128	930	7,565	1,018	1,030	760
Ohio	32,615	34,892	348,266	31,607	31,586	28,023
Oklahoma	18,742	18,887	202,151	19,290	16,009	16,798
Oregon	6,525	8,402	87,754	8,500	8,527	8,658
Pennsylvania	23,150	23,292	257,884	20,225	22,305	18,980
Rhode Island	1,993	2,131	26,985	2,166	2,355	2,501
South Carolina	7,983	8,080	93,933	8,462	8,603	8,800
South Dakota	792	877	8,273	819	798	557
Tennessee	12,935	11,832	128,418	12,872	13,066	11,146
Texas	175,662	192,066	2,071,780	166,935	159,473	167,443
Utah	3,698	3,809	42,335	3,705	3,674	3,603
Vermont	197	181	1,926	189	208	172
Virginia	7,950	8,425	R83,665	9,500	7,510	6,510
Washington	8,361	9,112	114,620	9,782	10,903	10,712
West Virginia	4,167	4,501	51,432	4,572	4,541	4,418
Wisconsin	14,670	17,780	149,696	15,515	14,706	11,628
Wyoming	NA	NA	43,925	4,057	4,214	4,156
Total	766,563	807,731	R8,795,641	781,255	765,945	R727,561

See footnotes at end of table.

Table 16. Natural Gas Deliveries to Industrial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996					
	September	August	July	June	May	April
Alabama	17,183	16,496	16,794	15,727	16,863	17,310
Alaska	6,288	6,961	6,577	6,268	5,808	6,123
Arizona	2,279	2,172	2,220	2,180	1,453	2,042
Arkansas	7,896	8,990	7,390	7,565	7,760	9,395
California	59,349	64,670	60,431	53,941	53,833	52,449
Colorado	6,107	6,630	5,807	6,309	6,597	8,185
Connecticut	2,548	2,781	2,286	2,457	2,467	2,809
Delaware	1,138	1,117	1,122	1,303	1,207	1,046
District of Columbia	0	0	0	0	0	0
Florida	11,770	11,552	11,552	10,988	12,826	11,552
Georgia	14,813	15,983	14,011	14,632	15,449	15,477
Hawaii	0	0	0	0	0	0
Idaho [a]	2,802	2,408	2,697	2,698	2,850	2,856
Illinois	20,140	21,041	19,178	21,336	25,635	27,988
Indiana	20,413	19,676	20,037	42,147	9,883	22,984
Iowa	7,552	8,875	8,305	8,419	9,150	9,701
Kansas	9,960	11,693	11,254	11,669	9,541	10,308
Kentucky	6,743	6,430	6,045	8,704	6,403	7,246
Louisiana	92,337	89,426	87,374	90,176	87,567	91,694
Maine	185	177	144	186	181	155
Maryland	4,121	4,402	4,262	3,970	4,064	4,983
Massachusetts	8,116	8,889	7,274	7,212	7,165	8,260
Michigan	25,020	24,539	24,946	26,087	28,405	30,792
Minnesota	7,792	7,566	7,989	8,586	8,510	9,983
Mississippi	6,642	6,532	6,839	6,590	6,733	7,012
Missouri	4,469	5,765	4,070	4,644	5,311	6,382
Montana	1,335	1,380	1,224	1,174	1,286	1,311
Nebraska	1,857	1,928	1,976	2,127	2,114	2,576
Nevada	2,714	2,773	2,847	2,710	2,858	2,524
New Hampshire	404	405	382	390	424	450
New Jersey	16,094	15,593	16,756	15,540	16,175	17,426
New Mexico	1,570	1,606	1,625	1,679	1,475	1,776
New York	20,727	22,197	21,237	21,379	19,349	22,857
North Carolina	9,211	8,952	8,169	8,361	9,110	8,777
North Dakota	561	409	434	353	605	608
Ohio	23,475	23,938	22,619	29,133	26,206	28,680
Oklahoma	16,821	17,167	16,923	14,670	15,962	14,948
Oregon	7,933	7,887	7,327	6,795	6,704	5,970
Pennsylvania	17,633	19,207	17,214	18,560	19,897	21,123
Rhode Island	2,296	2,362	1,914	2,114	2,210	2,087
South Carolina	7,925	7,991	7,710	7,826	8,236	8,275
South Dakota	443	496	489	478	509	550
Tennessee	10,558	10,115	9,710	9,995	9,460	9,591
Texas	170,430	174,691	165,822	170,788	179,149	178,591
Utah	3,445	3,382	3,261	3,171	3,374	3,435
Vermont	149	153	106	152	175	133
Virginia	5,368	7,286	7,089	4,478	6,649	5,953
Washington	10,209	9,965	8,949	7,684	8,630	8,821
West Virginia	4,781	4,033	4,033	3,815	4,020	4,070
Wisconsin	9,591	9,206	8,540	9,186	10,790	13,184
Wyoming	3,205	3,337	3,112	3,545	3,462	3,610
Total	694,397	711,229	678,073	709,897	694,487	734,057

See footnotes at end of table.

Table 16. Natural Gas Deliveries to Industrial Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996			1995		
	March	February	January	Total	December	November
Alabama	17,354	16,957	16,946	204,060	17,790	17,076
Alaska	6,764	6,115	4,807	64,977	4,714	3,999
Arizona	2,112	1,897	2,152	27,663	2,296	2,248
Arkansas	12,224	12,109	13,120	138,803	11,998	12,094
California	49,361	51,616	51,774	687,921	56,444	54,388
Colorado	7,182	9,397	7,112	72,439	5,739	5,243
Connecticut	3,036	2,777	2,159	33,106	3,028	3,158
Delaware	1,314	1,082	1,170	19,399	1,287	1,669
District of Columbia	0	0	0	0	0	0
Florida	11,679	10,963	10,739	133,477	15,661	10,973
Georgia	15,227	12,024	14,490	183,692	16,401	16,694
Hawaii	0	0	0	0	0	0
Idaho [a]	3,206	3,062	3,335	34,024	3,129	2,943
Illinois	32,566	33,454	38,681	321,465	35,704	32,284
Indiana	26,207	25,615	29,228	275,487	26,872	24,695
Iowa	10,401	9,701	11,082	115,080	12,216	9,887
Kansas	10,938	11,844	14,074	129,515	12,193	10,508
Kentucky	8,414	8,194	10,051	90,764	8,834	8,071
Louisiana	88,725	82,114	79,267	1,044,136	85,024	83,880
Maine	182	164	171	1,993	169	242
Maryland	4,673	3,251	3,579	48,963	3,106	3,881
Massachusetts	8,835	8,005	8,780	107,730	9,656	9,132
Michigan	35,200	35,214	34,241	326,551	32,701	27,912
Minnesota	9,162	7,846	9,548	106,189	10,889	9,114
Mississippi	7,373	7,151	6,481	84,526	7,352	7,334
Missouri	6,973	7,163	7,906	68,924	7,185	6,164
Montana	1,435	1,512	1,807	18,135	1,821	1,753
Nebraska	2,857	2,666	2,828	44,767	3,141	4,125
Nevada	2,649	2,545	2,750	30,641	2,702	2,612
New Hampshire	432	330	357	4,607	348	450
New Jersey	15,442	16,487	18,169	209,014	19,886	18,318
New Mexico	1,614	1,960	2,044	21,095	2,469	2,100
New York	[R]23,214	22,936	26,799	278,576	26,167	24,647
North Carolina	9,025	6,955	7,299	106,731	8,684	9,303
North Dakota	630	577	581	6,505	627	600
Ohio	31,069	33,410	38,520	336,552	35,635	30,953
Oklahoma	17,717	16,794	19,054	194,101	15,082	16,493
Oregon	6,376	6,164	6,913	68,904	6,418	5,836
Pennsylvania	23,168	22,258	37,314	249,928	22,158	24,198
Rhode Island	1,833	1,647	3,499	35,109	4,305	3,048
South Carolina	7,668	6,330	6,107	98,332	6,928	8,251
South Dakota	1,684	823	629	6,933	702	730
Tennessee	9,912	10,208	11,785	125,814	11,360	10,937
Texas	183,201	176,101	179,155	1,923,763	179,078	163,975
Utah	3,636	3,721	3,928	42,373	3,805	3,378
Vermont	223	148	119	2,159	254	221
Virginia	[R]8,759	7,239	7,326	97,499	9,819	7,113
Washington	9,105	9,810	10,049	109,997	9,389	9,594
West Virginia	4,458	4,176	4,516	52,239	4,576	4,834
Wisconsin	15,050	15,019	17,283	146,070	15,931	14,483
Wyoming	3,464	4,317	3,446	48,856	[NA]	[NA]
Total	[R]763,723	741,844	793,172	8,579,585	786,266	736,229

[a] Small volumes of natural gas representing onsystem sales to industrial consumers in Idaho are included in the annual total but not in monthly components. Deliveries for total year 1995 in Idaho do not equal the sum of the twelve months.

[R] = Revised Data.

[NA] = Not Available.

Notes: Geographic coverage is the 50 States and the District of Columbia. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 17. Natural Gas Deliveries to Electric Utility[a] Consumers, by State, 1995-1997

(Million Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997		
				May	April	March
Alabama	1,318	1,302	1,350	483	386	168
Alaska	15,080	13,201	12,602	2,903	2,924	3,594
Arizona	4,731	4,100	4,587	2,742	723	588
Arkansas	2,293	9,876	7,690	583	614	253
California	118,833	90,263	138,700	37,243	25,412	24,423
Colorado	1,651	1,644	1,460	397	267	328
Connecticut	4,714	974	8,898	1,141	1,229	944
Delaware	9,000	7,818	9,283	1,064	1,841	2,280
District of Columbia	0	0	0	0	0	0
Florida	113,498	99,098	113,481	29,415	27,872	28,725
Georgia	469	1,188	1,102	203	176	30
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	13,290	7,237	11,287	2,931	4,976	2,503
Indiana	894	1,698	2,060	210	200	199
Iowa	1,452	1,336	687	286	269	405
Kansas	3,575	5,384	6,177	1,226	840	553
Kentucky	459	736	333	21	117	130
Louisiana	88,891	84,168	108,525	25,570	19,113	15,854
Maine	0	0	0	0	0	0
Maryland	2,773	1,503	3,373	726	1,478	337
Massachusetts	20,036	8,423	19,423	3,811	6,611	5,258
Michigan	11,780	11,919	11,482	2,772	2,282	2,434
Minnesota	2,697	1,395	2,599	596	621	698
Mississippi	16,578	23,235	39,296	4,689	3,034	2,932
Missouri	487	1,377	2,798	96	175	78
Montana	132	115	41	7	15	18
Nebraska	475	865	605	110	174	82
Nevada	15,390	15,082	12,810	5,220	3,518	3,822
New Hampshire	1	1	413	0	0	0
New Jersey	7,209	6,575	10,820	1,480	1,869	2,092
New Mexico	11,812	10,192	13,596	2,445	2,548	2,769
New York	58,826	31,337	82,887	16,444	11,135	14,307
North Carolina	97	427	449	61	26	1
North Dakota	0	0	0	0	0	0
Ohio	477	807	965	105	106	71
Oklahoma	31,644	42,662	51,307	6,747	7,058	6,712
Oregon	498	0	7,038	3	0	200
Pennsylvania	1,543	1,457	6,753	295	326	324
Rhode Island	10,590	9,302	0	2,447	1,854	2,180
South Carolina	166	216	896	67	72	12
South Dakota	255	22	35	85	85	39
Tennessee	0	44	0	0	0	0
Texas	307,885	392,334	387,169	73,272	59,323	60,401
Utah	639	562	4,367	126	123	134
Vermont	12	3	61	3	3	3
Virginia	3,304	2,785	8,238	626	1,398	1,058
Washington	99	150	1,217	86	5	0
West Virginia	100	87	196	33	9	23
Wisconsin	8,759	1,985	1,456	1,861	1,777	2,165
Wyoming	34	29	49	6	6	6
Total	894,449	894,913	1,098,562	230,637	192,593	189,131

See footnotes at end of table.

Table 17. Natural Gas Deliveries to Electric Utility[a] Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1997		1996			
	February	January	Total	December	November	October
Alabama	156	125	6,146	291	480	384
Alaska	2,439	3,220	31,767	3,078	2,683	2,637
Arizona	358	319	19,248	443	296	2,242
Arkansas	217	626	33,988	1,226	297	201
California	14,231	17,524	318,035	17,182	22,900	32,454
Colorado	261	398	5,511	454	319	506
Connecticut	1,208	192	10,456	131	912	1,643
Delaware	2,069	1,746	23,370	1,048	2,129	2,330
District of Columbia	0	0	0	0	0	0
Florida	17,001	10,485	283,557	13,124	17,908	28,677
Georgia	18	42	4,674	43	80	9
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	1,679	1,201	25,863	550	1,859	1,046
Indiana	137	147	4,330	236	256	144
Iowa	231	261	3,491	236	232	211
Kansas	409	547	22,607	672	578	808
Kentucky	80	111	1,836	82	104	65
Louisiana	13,608	14,747	252,139	12,921	14,958	18,877
Maine	0	0	0	0	0	0
Maryland	47	185	8,455	211	263	485
Massachusetts	2,785	1,570	45,037	1,562	3,081	8,648
Michigan	2,375	1,916	32,559	2,888	3,151	2,705
Minnesota	124	658	5,301	419	403	469
Mississippi	2,717	3,207	83,251	3,671	6,561	5,392
Missouri	53	86	5,223	69	238	193
Montana	27	64	470	72	85	42
Nebraska	78	31	2,351	82	94	122
Nevada	1,363	1,468	46,766	2,311	2,458	4,266
New Hampshire	0	0	3	0	1	0
New Jersey	1,023	746	25,825	445	1,038	1,481
New Mexico	1,991	2,059	29,969	2,244	2,423	2,787
New York	12,117	4,823	142,688	5,108	10,715	14,459
North Carolina	9	0	2,381	1	1	112
North Dakota	0	0	3	0	0	0
Ohio	71	124	2,867	106	259	56
Oklahoma	4,867	6,260	136,436	6,107	8,068	9,395
Oregon	0	295	14,015	334	1,289	3,049
Pennsylvania	316	281	7,239	282	654	650
Rhode Island	2,021	2,088	25,071	2,167	2,449	2,424
South Carolina	4	11	1,206	20	16	23
South Dakota	19	26	725	35	80	5
Tennessee	0	0	572	0	1	0
Texas	54,897	59,992	1,039,155	51,332	59,062	75,410
Utah	118	138	3,428	142	130	133
Vermont	2	2	24	3	3	3
Virginia	44	178	10,275	333	193	473
Washington	2	6	6,590	21	358	801
West Virginia	23	12	205	43	3	1
Wisconsin	1,782	1,174	7,303	702	803	572
Wyoming	7	9	87	6	6	7
Total	142,984	139,104	2,732,496	132,434	169,879	226,394

See footnotes at end of table.

Table 17. Natural Gas Deliveries to Electric Utility[a] Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996					
	September	August	July	June	May	April
Alabama	593	708	1,457	931	840	112
Alaska	2,449	2,595	2,514	2,611	2,592	2,434
Arizona	2,145	4,797	3,286	1,940	1,047	828
Arkansas	4,215	5,421	7,029	5,722	4,342	3,663
California	35,564	53,941	42,047	23,684	18,648	18,202
Colorado	724	798	665	400	584	246
Connecticut	2,168	2,269	1,409	951	595	298
Delaware	2,562	2,416	2,342	2,724	1,189	1,291
District of Columbia	0	0	0	0	0	0
Florida	33,595	33,376	29,468	28,311	31,435	21,801
Georgia	243	588	1,514	1,010	1,000	61
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	2,309	4,289	4,369	4,205	2,562	2,103
Indiana	197	570	483	746	506	248
Iowa	277	298	355	545	435	289
Kansas	1,959	4,148	4,884	4,175	1,661	728
Kentucky	83	281	249	235	236	139
Louisiana	21,484	32,455	35,959	31,317	26,523	13,556
Maine	0	0	0	0	0	0
Maryland	1,521	1,920	1,273	1,278	980	220
Massachusetts	9,009	7,190	3,508	3,616	2,443	2,108
Michigan	3,320	2,746	2,767	3,062	2,613	2,011
Minnesota	602	624	690	699	273	342
Mississippi	9,812	12,074	10,509	11,998	8,484	4,734
Missouri	287	896	1,152	1,011	802	184
Montana	35	23	45	52	8	4
Nebraska	161	213	348	466	320	202
Nevada	4,900	6,394	6,552	4,802	4,271	2,737
New Hampshire	0	0	0	0	0	0
New Jersey	3,575	4,064	4,441	4,207	1,984	647
New Mexico	2,492	3,456	3,480	2,895	3,067	1,997
New York	21,421	24,086	18,789	16,773	13,132	5,595
North Carolina	75	196	766	802	377	3
North Dakota	1	1	0	1	0	0
Ohio	257	593	312	477	426	46
Oklahoma	13,201	19,557	19,747	17,701	12,313	7,340
Oregon	3,801	3,202	2,339	0	0	0
Pennsylvania	1,150	1,778	676	591	506	262
Rhode Island	2,236	2,417	2,031	2,045	2,011	1,700
South Carolina	350	64	239	278	188	9
South Dakota	76	178	155	174	2	3
Tennessee	79	240	130	78	15	0
Texas	90,570	119,967	136,109	114,370	114,229	72,920
Utah	554	870	810	227	8	128
Vermont	3	2	3	4	0	2
Virginia	1,677	1,578	1,704	1,532	860	107
Washington	2,251	2,558	451	0	1	0
West Virginia	26	15	11	21	9	16
Wisconsin	739	1,198	532	772	696	229
Wyoming	8	9	4	17	5	5
Total	284,758	367,059	357,604	299,454	264,216	169,550

See footnotes at end of table.

Table 17. Natural Gas Deliveries to Electric Utility[a] Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996			1995		
	March	February	January	Total	December	November
Alabama	134	125	92	7,377	107	226
Alaska	2,763	2,573	2,839	29,809	2,528	2,436
Arizona	649	550	1,025	18,846	510	502
Arkansas	1,181	433	258	32,750	813	622
California	13,728	15,742	23,942	394,698	23,944	30,266
Colorado	317	305	193	3,798	259	230
Connecticut	28	27	26	19,310	44	928
Delaware	1,742	939	2,657	27,010	1,964	2,478
District of Columbia	0	0	0	0	0	0
Florida	15,773	13,992	16,097	318,854	17,056	25,857
Georgia	98	15	13	7,834	17	63
Hawaii	0	0	0	0	0	0
Idaho	0	0	0	0	0	0
Illinois	856	421	1,296	39,143	2,782	3,216
Indiana	233	337	373	8,349	671	623
Iowa	274	162	176	3,614	145	129
Kansas	726	701	1,568	27,945	1,090	1,050
Kentucky	119	56	186	866	170	124
Louisiana	15,080	14,146	14,863	322,923	16,716	21,614
Maine	0	0	0	0	0	0
Maryland	126	69	109	18,833	140	435
Massachusetts	1,485	1,435	952	64,623	1,732	3,431
Michigan	2,100	2,214	2,981	35,784	3,540	3,217
Minnesota	351	200	229	8,292	255	456
Mississippi	3,311	2,838	3,868	111,229	6,426	5,181
Missouri	111	134	146	12,830	234	500
Montana	37	23	43	388	27	32
Nebraska	139	80	123	3,059	265	269
Nevada	2,474	2,488	3,113	40,134	2,686	2,463
New Hampshire	0	0	0	2,248	0	9
New Jersey	483	1,291	2,171	45,897	2,199	2,576
New Mexico	2,383	861	1,883	31,924	1,842	2,025
New York	5,703	3,392	3,514	246,265	8,774	16,690
North Carolina	3	9	35	3,146	66	114
North Dakota	0	0	0	1	0	0
Ohio	58	90	187	7,459	315	402
Oklahoma	7,490	6,910	8,610	154,114	9,251	7,826
Oregon	0	0	0	19,136	455	1,700
Pennsylvania	225	120	344	24,697	267	380
Rhode Island	2,395	1,523	1,674	5,002	2,061	1,571
South Carolina	9	5	4	6,615	12	10
South Dakota	6	10	1	931	26	35
Tennessee	29	0	0	2,055	0	0
Texas	72,619	61,382	71,184	1,047,274	61,416	55,785
Utah	137	151	138	8,707	188	452
Vermont	0	0	1	138	48	13
Virginia	314	505	998	16,414	761	1,209
Washington	57	26	65	6,356	12	268
West Virginia	13	16	33	410	23	40
Wisconsin	353	271	436	9,289	610	465
Wyoming	8	5	7	128	8	11
Total	156,120	136,572	168,455	3,196,507	172,457	197,926

[a] Includes all steam electric utility generating plants with a combined capacity of 50 megawatts or greater.

Notes: Geographic coverage is the 50 States and the District of Columbia. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-759, "Monthly Power Plant Report."

Table 18. Natural Gas Deliveries to All Consumers, by State, 1995-1997

(Million Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997		
				May	April	March
Alabama	133,768	143,913	132,056	22,734	24,268	25,301
Alaska	66,338	64,375	53,204	10,857	12,458	13,869
Arizona	50,055	44,928	48,541	8,824	7,593	10,140
Arkansas	106,403	114,256	106,870	16,464	17,586	20,556
California	776,747	694,925	813,137	143,020	143,240	153,465
Colorado	NA	149,496	136,059	NA	22,183	28,343
Connecticut	67,795	64,557	70,565	8,930	12,972	14,439
Delaware	25,271	24,711	26,660	3,369	4,734	5,675
District of Columbia	18,666	20,177	19,448	2,318	2,158	4,214
Florida	199,301	187,205	196,971	45,869	44,411	45,235
Georgia	167,032	183,358	167,176	23,734	28,933	29,690
Hawaii	1,122	1,175	1,190	207	R215	225
Idaho	31,131	30,918	28,626	4,316	5,686	6,456
Illinois	578,365	605,933	549,102	64,766	89,445	117,027
Indiana	286,977	282,628	272,051	39,488	46,650	58,062
Iowa	128,530	135,799	123,801	15,115	20,294	25,485
Kansas	124,611	144,364	131,294	16,172	19,448	24,751
Kentucky	102,283	108,520	99,238	12,459	15,498	19,777
Louisiana	NA	566,114	595,497	NA	104,033	97,008
Maine	3,120	2,923	2,636	434	562	702
Maryland	NA	103,452	94,568	NA	18,889	20,410
Massachusetts	190,262	174,705	176,920	25,358	38,160	42,503
Michigan	526,644	554,711	496,604	70,672	87,986	112,460
Minnesota	182,652	188,416	172,793	20,045	28,712	38,950
Mississippi	NA	91,294	103,541	NA	13,255	15,253
Missouri	159,152	168,929	151,109	15,128	24,166	28,562
Montana	29,230	29,004	26,118	3,233	R4,532	5,833
Nebraska	NA	62,164	59,330	NA	10,721	13,589
Nevada	54,721	51,554	48,107	11,106	9,867	12,114
New Hampshire	11,566	10,742	10,232	1,843	2,115	2,437
New Jersey	289,211	313,870	298,761	35,617	50,241	67,737
New Mexico	57,197	52,586	51,441	8,157	7,737	11,417
New York	NA	NA	555,270	NA	106,095	129,729
North Carolina	103,826	106,924	96,938	15,136	17,643	19,956
North Dakota	19,834	18,111	16,674	2,193	3,018	4,403
Ohio	480,205	508,841	466,283	59,605	75,292	98,030
Oklahoma	192,580	203,780	201,251	30,508	34,037	37,926
Oregon	69,810	66,075	65,300	9,531	11,834	14,354
Pennsylvania	355,020	392,063	353,300	45,280	59,489	73,716
Rhode Island	40,493	39,069	32,306	6,911	7,506	8,623
South Carolina	68,941	67,876	68,257	11,594	12,376	13,452
South Dakota	NA	19,487	16,609	NA	2,900	3,604
Tennessee	134,601	132,149	118,598	18,115	21,934	26,669
Texas	NA	1,541,183	1,394,318	NA	256,063	293,722
Utah	67,090	64,083	65,266	6,853	11,440	13,231
Vermont	4,418	4,207	4,014	569	782	930
Virginia	115,994	119,608	114,734	16,604	20,201	21,529
Washington	109,309	109,422	102,636	15,207	R18,530	23,033
West Virginia	63,819	62,114	58,275	13,606	13,484	9,699
Wisconsin	NA	217,787	192,660	NA	34,552	45,247
Wyoming	NA	34,934	33,444	NA	4,722	4,848
Total	9,425,382	9,620,698	9,219,779	1,440,409	R1,630,650	1,914,383

See footnotes at end of table.

Table 18. Natural Gas Deliveries to All Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1997		1996			
	February	January	Total	December	November	October
Alabama	29,964	31,500	296,990	27,319	23,583	22,119
Alaska	13,399	15,754	148,552	15,166	13,247	12,312
Arizona	11,178	12,320	102,298	10,389	7,436	7,463
Arkansas	24,791	27,006	233,781	22,795	18,544	15,455
California	163,023	173,999	1,707,167	168,211	149,115	141,022
Colorado	32,974	37,006	270,081	32,976	23,011	14,865
Connecticut	16,125	15,328	126,655	13,863	10,880	8,940
Delaware	5,923	5,571	54,125	4,229	4,471	4,241
District of Columbia	4,954	5,022	33,701	4,755	2,456	1,382
Florida	34,471	29,314	480,111	30,258	34,115	43,675
Georgia	39,917	44,759	370,880	41,449	36,056	24,373
Hawaii	237	238	2,652	219	199	208
Idaho	7,129	7,543	61,034	6,739	5,427	4,266
Illinois	133,897	173,229	1,113,544	151,102	123,066	66,501
Indiana	64,843	77,935	568,117	66,160	53,888	36,632
Iowa	28,945	38,692	259,958	33,559	27,130	15,451
Kansas	28,858	35,382	296,671	34,068	26,472	14,303
Kentucky	23,324	31,225	208,649	26,021	22,567	13,104
Louisiana	105,567	112,329	1,397,624	109,242	116,242	112,504
Maine	643	778	5,726	601	619	478
Maryland	23,671	28,214	195,537	22,821	17,112	11,400
Massachusetts	44,637	39,603	354,970	36,611	31,456	28,417
Michigan	120,917	134,610	989,668	114,278	92,403	56,809
Minnesota	43,532	51,412	349,367	46,826	36,442	21,218
Mississippi	17,523	19,136	[R]218,733	16,490	17,003	[R]15,059
Missouri	45,919	45,376	285,530	37,252	24,113	12,326
Montana	7,209	8,424	55,377	7,463	5,865	3,699
Nebraska	19,080	18,564	119,265	15,566	10,482	7,778
Nevada	10,293	11,340	121,777	10,928	8,996	8,928
New Hampshire	2,626	2,545	18,951	2,120	1,856	1,143
New Jersey	65,638	69,978	594,576	73,944	49,081	35,154
New Mexico	13,722	16,164	114,340	13,947	10,595	7,253
New York	142,900	142,444	NA	117,412	91,875	66,767
North Carolina	25,812	25,279	210,163	23,018	18,744	14,596
North Dakota	4,992	5,227	32,024	4,619	3,219	1,791
Ohio	113,267	134,011	916,665	110,426	88,642	55,791
Oklahoma	43,401	46,707	458,228	42,413	32,877	30,172
Oregon	15,522	18,569	160,546	17,620	15,290	14,366
Pennsylvania	84,396	92,139	695,388	79,260	63,106	40,230
Rhode Island	8,649	8,804	81,964	7,968	7,190	6,306
South Carolina	15,601	15,917	[R]144,361	15,190	12,398	10,765
South Dakota	4,507	5,685	34,691	4,910	3,529	1,711
Tennessee	34,342	33,541	255,525	29,273	23,932	15,968
Texas	288,325	327,959	3,566,301	273,464	253,629	267,075
Utah	16,672	18,893	129,651	16,278	12,744	10,028
Vermont	1,059	1,078	7,324	844	697	439
Virginia	27,267	30,393	[R]229,408	28,351	20,904	13,251
Washington	25,043	27,497	232,030	26,216	21,948	17,141
West Virginia	[R]12,717	14,312	118,099	13,251	10,525	7,734
Wisconsin	48,970	NA	399,549	51,027	43,385	24,041
Wyoming	5,149	6,193	75,849	9,853	8,132	6,744
Total	[R]2,103,525	2,336,415	[R]19,968,761	2,068,759	1,736,696	[R]1,373,394

See footnotes at end of table.

Table 18. Natural Gas Deliveries to All Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996					
	September	August	July	June	May	April
Alabama	20,332	19,593	20,743	19,388	22,384	26,632
Alaska	10,693	11,277	10,709	10,773	10,922	12,065
Arizona	7,031	9,583	8,229	7,237	5,974	7,607
Arkansas	14,353	16,427	16,407	15,543	15,591	20,877
California	138,509	157,850	138,209	119,325	118,768	124,638
Colorado	11,832	12,078	11,736	14,087	18,521	26,966
Connecticut	7,524	7,714	6,750	6,427	7,612	11,035
Delaware	4,108	3,913	3,865	4,587	3,285	4,160
District of Columbia	1,173	1,129	1,216	1,412	2,050	3,623
Florida	48,884	48,289	44,583	43,102	48,597	38,893
Georgia	20,839	22,140	21,421	21,244	23,975	30,727
Hawaii	211	204	216	220	215	238
Idaho	3,587	3,040	3,344	3,719	4,536	5,166
Illinois	42,724	40,200	40,334	43,682	65,026	90,570
Indiana	26,721	25,801	26,095	50,192	23,800	48,030
Iowa	11,705	11,855	11,529	12,929	16,330	21,463
Kansas	15,213	21,226	21,453	19,572	17,483	22,219
Kentucky	9,468	9,138	8,482	11,350	10,460	16,338
Louisiana	117,049	125,047	126,442	124,985	118,351	112,844
Maine	291	274	242	297	366	444
Maryland	10,255	10,660	9,716	10,121	12,448	16,754
Massachusetts	24,605	22,832	17,360	18,985	23,805	30,966
Michigan	43,754	40,163	41,232	46,318	68,149	93,033
Minnesota	14,049	12,873	13,574	15,967	21,334	31,147
Mississippi	18,432	20,596	19,342	20,516	17,860	16,940
Missouri	9,756	11,484	10,217	11,454	15,946	26,353
Montana	2,517	2,217	2,125	2,487	3,594	4,732
Nebraska	5,337	5,580	6,892	5,465	6,827	10,437
Nevada	9,434	10,882	11,277	9,779	9,812	8,913
New Hampshire	769	747	714	861	1,252	1,801
New Jersey	29,805	29,780	31,667	31,275	36,891	52,628
New Mexico	6,099	7,408	8,345	8,107	6,745	9,105
New York	61,672	63,917	59,261	62,398	72,723	93,201
North Carolina	11,915	11,647	11,294	12,024	13,678	18,923
North Dakota	1,135	925	942	1,281	2,170	3,212
Ohio	35,016	35,443	34,936	47,570	53,242	80,030
Oklahoma	33,312	39,743	39,918	36,014	33,626	34,058
Oregon	13,575	12,666	11,471	9,482	10,784	10,846
Pennsylvania	28,704	31,894	27,758	32,373	41,927	60,662
Rhode Island	5,616	5,671	4,849	5,296	6,192	6,613
South Carolina	9,779	9,420	9,297	[R]9,636	[R]10,514	13,110
South Dakota	1,192	1,188	1,171	1,502	1,932	2,978
Tennessee	14,241	13,443	12,963	13,556	14,505	21,844
Texas	281,873	315,725	324,503	308,851	321,382	292,108
Utah	7,821	6,544	6,510	5,643	6,988	10,578
Vermont	299	272	227	339	497	685
Virginia	10,930	12,380	12,873	11,109	13,466	17,731
Washington	15,951	15,489	12,883	12,980	16,524	18,409
West Virginia	6,749	5,913	6,024	5,790	7,267	10,514
Wisconsin	16,015	15,625	14,035	17,634	24,608	34,119
Wyoming	3,965	3,913	3,685	4,622	5,819	6,747
Total	1,246,820	1,323,822	1,289,067	[R]1,309,506	[R]1,416,757	1,663,710

See footnotes at end of table.

Table 18. Natural Gas Deliveries to All Consumers, by State, 1995-1997

(Million Cubic Feet) — Continued

State	1996			1995		
	March	February	January	Total	December	November
Alabama	29,281	33,118	32,499	287,239	28,963	23,381
Alaska	14,222	14,370	12,796	134,996	12,726	10,307
Arizona	9,180	9,858	12,308	101,731	8,762	6,361
Arkansas	23,458	26,518	27,813	240,071	24,157	18,503
California	136,932	148,523	166,064	1,839,721	163,271	141,117
Colorado	31,107	37,595	35,307	247,180	25,542	20,007
Connecticut	14,152	15,422	16,336	131,130	13,952	10,343
Delaware	5,467	5,148	6,651	60,658	5,333	5,165
District of Columbia	3,939	5,070	5,495	32,735	4,773	2,362
Florida	33,656	31,778	34,281	507,329	38,384	41,005
Georgia	40,569	39,687	48,401	362,734	45,832	37,428
Hawaii	234	241	247	2,773	223	221
Idaho	6,416	7,356	7,439	57,407	6,178	5,305
Illinois	131,207	147,434	171,695	1,065,238	150,677	122,315
Indiana	63,320	68,685	78,793	527,719	67,428	52,765
Iowa	29,517	31,838	36,652	251,262	34,779	27,190
Kansas	29,440	33,982	41,240	286,430	36,741	22,381
Kentucky	24,378	25,967	31,376	196,392	27,754	22,164
Louisiana	114,401	110,488	110,030	1,443,515	111,753	111,708
Maine	676	693	743	5,333	709	593
Maryland	22,396	24,298	27,557	191,272	23,769	16,788
Massachusetts	38,096	40,663	41,174	360,429	38,915	29,250
Michigan	123,153	131,901	138,475	936,466	127,454	90,578
Minnesota	41,181	44,184	50,570	333,900	46,101	35,421
Mississippi	17,137	19,284	20,073	242,887	20,617	16,534
Missouri	35,478	43,511	47,640	271,956	36,814	23,737
Montana	5,934	7,379	7,365	51,660	6,443	5,486
Nebraska	13,215	15,592	16,093	132,923	NA	NA
Nevada	10,245	10,560	12,024	110,273	9,616	7,869
New Hampshire	2,393	2,595	2,701	19,877	2,329	1,629
New Jersey	64,143	76,135	84,073	588,315	76,194	50,145
New Mexico	9,915	11,189	15,632	105,796	11,879	9,301
New York	R120,659	NA	NA	1,131,325	122,091	96,317
North Carolina	21,512	25,453	27,358	196,626	22,610	17,125
North Dakota	3,769	4,599	4,362	29,371	4,046	2,905
Ohio	111,938	121,775	141,857	877,112	123,470	90,931
Oklahoma	40,561	45,614	49,920	456,674	39,265	32,367
Oregon	13,312	15,649	15,484	138,545	13,661	12,166
Pennsylvania	83,838	91,367	114,269	680,495	89,477	72,297
Rhode Island	8,498	8,208	9,559	69,520	10,522	7,171
South Carolina	13,543	14,966	15,743	148,980	13,776	12,196
South Dakota	5,043	4,739	4,795	31,164	4,008	3,215
Tennessee	26,568	33,026	36,206	239,100	28,212	23,469
Texas	310,615	293,918	323,160	3,387,065	293,668	253,956
Utah	12,315	17,039	17,162	126,981	14,931	11,120
Vermont	962	1,015	1,049	7,268	1,065	653
Virginia	R27,585	29,425	31,401	239,616	31,620	21,147
Washington	22,245	26,815	25,428	211,791	22,286	19,597
West Virginia	13,456	14,859	16,018	113,908	13,999	11,239
Wisconsin	48,084	51,803	59,172	376,291	53,338	42,409
Wyoming	6,641	8,408	7,319	70,986	NA	NA
Total	R2,015,979	2,150,165	2,374,087	19,657,487	2,136,187	1,719,670

R = Revised Data.
NA = Not Available.

Notes: Geographic coverage is the 50 States and the District of Columbia. Gas volumes delivered for use as vehicle fuel are included in the annual total for commercial deliveries but not in the monthly components. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers" and Form EIA-759, "Monthly Power Plant Report."

Table 19. Average City Gate Price, by State, 1995-1997

(Dollars per Thousand Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997				
				May	April	March	February	January
Alabama	3.82	3.24	2.67	3.54	3.16	3.20	4.02	4.44
Alaska	1.15	1.58	1.70	1.78	0.38	1.84	1.80	1.88
Arizona	3.16	2.16	2.07	3.19	2.61	2.22	2.85	4.21
Arkansas	3.24	2.53	2.36	2.59	2.48	2.46	3.16	4.18
California	2.97	2.26	1.99	2.55	2.30	2.25	3.21	4.15
Colorado	NA	2.17	2.65	NA	NA	NA	NA	NA
Connecticut	5.39	5.19	4.74	4.81	4.94	4.82	6.00	5.82
Delaware	4.30	3.46	2.73	3.12	2.93	4.07	5.09	6.92
District of Columbia	—	—	—	—	—	—	—	—
Florida	4.06	3.74	2.57	2.86	3.49	4.04	4.56	4.61
Georgia	3.99	3.60	2.96	3.22	3.08	3.31	4.16	4.80
Hawaii	6.80	5.72	4.86	6.47	R7.21	6.50	7.73	6.16
Idaho	2.19	2.09	2.19	2.98	2.08	1.85	2.13	2.37
Illinois	3.17	3.17	2.45	3.06	2.48	2.43	3.30	3.79
Indiana	3.05	3.13	2.71	2.32	2.07	2.31	3.20	4.08
Iowa	3.51	3.11	2.70	3.49	2.83	3.05	3.66	3.99
Kansas	1.80	2.89	2.16	2.85	0.33	2.67	3.67	4.43
Kentucky	3.72	3.17	2.88	3.30	3.69	3.40	3.47	4.17
Louisiana	3.10	3.23	2.13	2.39	2.36	2.44	3.49	3.84
Maine	4.22	4.32	3.10	4.69	3.43	4.26	3.52	4.96
Maryland	NA	NA	2.70	NA	NA	3.32	3.82	4.14
Massachusetts	NA	3.53	3.21	2.86	3.26	2.97	4.12	NA
Michigan	3.05	2.95	2.68	2.60	2.56	2.66	3.28	3.98
Minnesota	3.37	2.81	2.42	2.64	2.41	2.70	3.48	4.51
Mississippi	NA	3.27	2.34	NA	2.91	2.92	3.48	4.25
Missouri	3.56	2.76	2.50	3.95	3.18	2.78	3.50	4.05
Montana	NA	2.83	3.23	2.27	R3.09	2.70	3.50	3.74
Nebraska	3.47	2.72	2.36	2.97	2.28	2.84	3.65	4.43
Nevada	3.39	2.72	2.77	2.72	2.81	2.96	3.37	4.13
New Hampshire	4.18	4.07	3.24	3.66	3.15	3.99	4.42	4.93
New Jersey	4.01	3.73	3.14	3.49	3.15	3.95	4.20	4.70
New Mexico	2.59	1.46	1.49	2.04	1.91	1.38	2.39	3.86
New York	NA	3.27	2.41	NA	NA	NA	NA	NA
North Carolina	4.01	3.68	2.87	3.83	3.40	3.51	4.34	4.36
North Dakota	3.32	2.72	2.74	2.97	2.54	2.43	3.59	4.22
Ohio	5.37	4.02	3.97	5.96	5.79	5.01	5.41	5.24
Oklahoma	3.15	2.55	2.70	2.22	2.22	3.09	3.68	3.52
Oregon	2.41	2.21	2.47	3.02	1.95	1.92	2.35	2.95
Pennsylvania	4.00	3.59	3.05	4.66	3.68	3.48	4.12	4.22
Rhode Island	4.08	3.93	3.04	4.81	3.46	3.16	4.26	4.85
South Carolina	3.68	3.95	3.14	3.54	3.25	2.95	3.97	4.20
South Dakota	NA	2.80	2.80	NA	3.02	2.54	3.95	4.11
Tennessee	NA	3.44	2.54	2.39	3.24	NA	3.73	4.03
Texas	3.74	3.17	3.04	2.50	2.38	3.01	4.23	4.73
Utah	2.56	2.17	3.25	1.93	2.15	2.72	2.76	2.65
Vermont	2.09	2.88	2.56	2.77	2.39	—	2.16	1.57
Virginia	4.19	3.61	2.92	4.88	3.27	3.49	3.96	5.14
Washington	NA	2.09	2.33	2.93	R2.18	1.89	2.62	3.45
West Virginia	3.16	3.37	2.75	3.20	2.87	2.10	3.52	3.70
Wisconsin	3.54	2.99	2.67	3.39	3.12	2.82	3.54	4.13
Wyoming	NA	NA	2.79	NA	NA	2.96	3.33	3.82
Total	3.50	3.16	2.75	3.15	R2.65	3.05	3.77	4.26

See footnotes at end of table.

Table 19. Average City Gate Price, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996							
	Total	December	November	October	September	August	July	June
Alabama	3.48	4.07	3.63	3.44	3.62	4.11	4.04	3.78
Alaska	1.58	1.59	1.60	1.55	1.57	1.54	1.54	1.57
Arizona	2.78	4.14	3.29	2.66	3.02	3.58	2.94	2.57
Arkansas	2.76	3.68	3.04	2.46	2.29	2.59	2.76	2.82
California	2.59	3.81	3.00	2.38	2.35	2.78	2.43	2.56
Colorado	2.71	4.91	3.13	2.65	2.28	2.29	2.29	2.40
Connecticut	5.11	6.15	4.60	4.46	4.65	4.42	4.75	5.03
Delaware	3.59	4.82	3.42	2.85	3.03	3.80	4.22	3.44
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.69	4.49	3.90	3.28	3.03	3.57	3.58	3.31
Georgia	3.76	4.66	3.71	3.14	3.32	4.00	4.20	3.66
Hawaii	6.05	6.67	6.30	6.33	6.00	6.05	6.34	6.27
Idaho	2.24	2.30	2.10	2.11	2.72	2.48	5.26	3.39
Illinois	3.27	4.05	3.25	2.65	2.80	3.25	3.69	3.12
Indiana	NA	NA	3.16	2.49	2.04	2.70	3.30	3.10
Iowa	3.47	4.09	3.46	3.12	4.28	7.96	7.45	4.61
Kansas	3.07	3.77	3.38	2.91	2.65	3.08	3.57	3.51
Kentucky	3.41	4.40	3.59	2.94	3.16	3.04	3.07	3.08
Louisiana	3.13	4.30	3.24	2.20	2.26	2.69	3.01	2.71
Maine	4.29	4.34	3.64	3.93	3.91	4.35	5.04	5.51
Maryland	NA	4.65	3.71	3.44	5.20	5.85	6.04	5.63
Massachusetts	4.01	4.82	3.72	3.60	5.36	5.68	5.53	6.05
Michigan	2.90	3.73	3.07	2.49	2.31	2.98	2.87	2.64
Minnesota	3.07	3.78	3.19	2.65	2.91	3.32	4.13	2.88
Mississippi	3.29	4.34	3.14	2.83	2.59	2.89	3.10	2.90
Missouri	3.25	4.03	3.20	3.47	4.14	5.12	4.82	4.51
Montana	3.03	3.46	3.04	3.08	3.24	4.11	3.60	3.05
Nebraska	3.06	3.99	3.11	2.93	2.69	4.83	3.30	3.50
Nevada	3.17	3.97	3.46	2.96	3.22	3.80	3.44	3.37
New Hampshire	4.20	5.01	4.15	3.19	3.86	4.47	5.03	4.64
New Jersey	3.82	4.90	3.84	3.12	3.51	3.71	3.77	3.82
New Mexico	1.99	3.60	2.68	1.88	1.66	2.07	1.60	1.40
New York	3.29	4.38	3.03	2.86	2.61	3.15	3.13	3.17
North Carolina	3.74	4.26	3.48	3.22	3.67	3.94	3.75	3.75
North Dakota	2.94	3.80	3.10	2.49	2.54	3.44	2.90	2.78
Ohio	4.37	4.79	4.95	5.06	6.11	5.58	4.53	8.17
Oklahoma	2.56	2.84	2.44	1.99	2.53	2.65	2.51	2.40
Oregon	2.42	2.95	2.41	2.24	2.98	3.15	3.89	2.11
Pennsylvania	3.97	4.43	4.11	4.03	4.25	5.07	5.40	4.96
Rhode Island	4.41	5.20	4.04	3.91	5.94	6.51	7.46	6.42
South Carolina	3.90	4.60	3.76	3.26	3.53	3.87	4.01	3.49
South Dakota	3.19	3.98	3.37	2.87	3.42	6.37	4.74	3.96
Tennessee	4.04	6.64	3.71	2.92	3.39	3.67	3.48	3.67
Texas	3.23	4.21	3.49	2.73	2.95	3.06	3.04	2.91
Utah	2.25	2.39	3.32	1.66	2.22	2.08	2.15	2.12
Vermont	2.74	2.67	2.49	2.18	2.36	2.69	3.68	3.01
Virginia	3.89	5.13	3.69	3.34	3.40	4.42	4.52	4.93
Washington	2.44	3.14	2.50	1.94	2.71	3.21	3.57	3.39
West Virginia	3.33	3.53	3.25	3.57	3.77	4.29	3.66	3.28
Wisconsin	3.37	4.12	3.61	3.00	3.87	4.71	4.65	4.81
Wyoming	NA	2.55	2.18	1.91	2.84	2.92	2.44	NA
Total	3.34	4.20	3.47	2.93	3.03	3.48	3.48	3.39

See footnotes at end of table.

Table 19. Average City Gate Price, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996					1995		
	May	April	March	February	January	Total	December	November
Alabama	3.52	3.27	3.15	3.35	3.13	2.89	2.83	2.84
Alaska	1.56	1.58	1.60	1.60	1.56	1.67	1.67	1.66
Arizona	2.46	2.05	1.97	2.36	2.08	2.10	1.86	2.19
Arkansas	2.59	2.50	2.57	2.52	2.52	2.32	2.46	2.28
California	2.14	2.22	2.42	2.25	2.29	2.03	1.90	2.15
Colorado	2.50	2.93	2.16	2.18	2.08	2.65	2.60	2.56
Connecticut	4.94	5.22	4.66	5.37	5.55	4.70	4.60	4.13
Delaware	3.18	3.75	4.20	3.43	3.27	2.70	3.01	2.89
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.39	3.97	3.83	3.60	3.84	2.74	3.32	3.05
Georgia	3.74	3.51	3.82	3.36	3.71	2.96	2.95	2.80
Hawaii	6.32	5.74	5.53	5.49	5.60	5.20	4.65	5.43
Idaho	2.28	2.21	2.12	2.08	1.98	2.18	1.98	2.14
Illinois	2.83	2.93	3.49	3.73	2.66	2.59	2.53	2.32
Indiana	2.56	2.90	3.06	3.32	3.11	2.84	2.82	2.67
Iowa	4.19	3.13	2.82	3.03	2.62	2.82	2.73	2.63
Kansas	3.22	3.23	2.70	2.67	2.66	2.36	2.44	2.38
Kentucky	3.83	3.50	3.29	3.05	3.19	2.80	2.87	2.45
Louisiana	2.65	3.06	3.29	3.24	3.58	2.21	2.78	2.44
Maine	5.32	5.34	4.01	3.89	3.95	3.35	3.08	3.03
Maryland	4.35	4.01	3.70	NA	3.82	2.87	2.68	2.71
Massachusetts	4.40	3.97	3.32	3.17	3.65	3.53	3.35	3.14
Michigan	2.69	2.80	3.11	2.91	3.14	2.61	2.81	2.56
Minnesota	2.81	2.72	2.79	2.78	2.90	2.52	2.65	2.50
Mississippi	2.70	3.37	3.36	3.07	3.49	2.53	3.23	2.71
Missouri	3.86	3.20	2.61	2.59	2.52	2.73	2.57	2.55
Montana	2.81	3.18	2.52	2.98	2.83	3.01	2.72	2.65
Nebraska	3.41	3.04	2.71	2.45	2.66	2.49	2.34	2.43
Nevada	3.17	2.90	2.64	2.75	2.51	2.73	2.20	2.62
New Hampshire	4.09	4.09	4.06	3.99	4.14	3.39	3.60	3.44
New Jersey	4.61	3.75	3.15	3.49	4.09	3.34	3.40	3.45
New Mexico	1.22	1.18	1.40	1.69	1.53	1.46	1.44	1.58
New York	3.18	3.40	3.34	3.19	3.42	2.47	2.98	2.61
North Carolina	3.69	3.95	3.60	3.66	3.65	2.95	2.95	2.77
North Dakota	2.64	2.62	2.45	2.82	2.94	2.58	2.55	2.25
Ohio	4.87	4.06	3.90	3.80	3.81	3.84	3.46	3.34
Oklahoma	2.61	2.53	2.58	2.60	2.46	2.52	2.27	2.24
Oregon	2.40	2.27	2.19	1.96	2.06	2.42	1.71	2.36
Pennsylvania	3.94	4.66	3.62	3.28	3.26	3.09	2.95	2.63
Rhode Island	5.06	3.53	3.85	3.92	3.28	3.57	3.34	3.13
South Carolina	3.96	3.96	3.94	3.77	4.01	3.25	3.27	3.16
South Dakota	2.92	2.63	2.84	2.79	2.54	2.88	2.68	2.62
Tennessee	3.72	3.28	3.29	4.56	4.50	2.71	3.01	2.68
Texas	2.81	3.13	3.05	3.13	3.20	2.95	3.06	2.97
Utah	1.93	1.98	2.34	2.10	2.27	2.88	2.43	2.46
Vermont	2.66	3.10	2.83	2.82	2.93	2.61	2.38	2.19
Virginia	4.00	3.38	3.58	3.36	3.88	2.92	3.10	2.57
Washington	2.30	2.23	1.99	2.12	1.98	2.18	2.07	2.14
West Virginia	3.89	3.26	3.24	3.48	2.60	2.85	3.04	2.26
Wisconsin	3.42	3.48	2.88	2.78	2.87	2.83	2.75	2.48
Wyoming	NA	NA	NA	NA	NA	2.72	NA	NA
Total	3.18	3.22	3.17	3.16	3.13	2.78	2.83	2.67

R = Revised Data.
NA = Not Available.
— = Not Applicable.

Notes: Geographic coverage is the 50 States and the District of Columbia. Prices in this table represent the average price of natural gas by State at the point where the gas transferred from a pipeline to a local distribution company within the State. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 20. Average Price of Natural Gas Delivered to Residential Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997				
				May	April	March	February	January
Alabama	8.07	6.54	6.60	8.69	9.21	8.65	7.61	7.62
Alaska	3.71	3.35	3.56	3.88	3.75	3.79	3.66	3.63
Arizona	7.06	7.02	7.40	8.69	7.93	7.03	6.71	6.62
Arkansas	6.33	5.40	5.32	6.93	6.40	6.14	6.09	6.48
California	6.30	6.32	6.41	6.38	6.18	6.42	6.27	6.27
Colorado	NA	4.11	4.63	NA	NA	NA	NA	NA
Connecticut	10.37	9.90	9.90	10.71	10.07	9.66	10.96	10.41
Delaware	7.85	6.48	6.33	8.59	8.08	7.87	7.74	7.53
District of Columbia	9.22	8.59	8.21	9.18	8.74	8.57	9.36	9.81
Florida	11.44	10.38	9.02	13.09	12.61	12.12	10.69	10.57
Georgia	7.36	6.37	6.44	10.42	6.23	8.88	7.47	6.53
Hawaii	NA	19.18	17.01	21.78	R21.30	22.62	25.55	21.15
Idaho	4.92	5.08	5.51	5.22	5.10	4.95	4.80	4.81
Illinois	5.85	4.85	4.64	5.43	5.10	5.28	6.50	6.15
Indiana	6.23	5.05	5.42	7.23	6.70	6.28	6.06	5.82
Iowa	5.68	5.00	4.84	6.21	5.24	5.58	6.01	5.57
Kansas	6.32	5.32	4.51	6.58	6.11	5.98	6.58	6.34
Kentucky	6.18	5.03	4.96	6.67	6.85	6.32	6.02	5.87
Louisiana	6.87	6.06	5.45	7.52	6.09	6.28	6.86	7.34
Maine	8.49	7.71	7.30	7.95	9.05	8.65	8.66	8.10
Maryland	NA	6.88	6.27	NA	NA	NA	NA	NA
Massachusetts	NA	8.76	9.05	7.49	9.90	9.70	9.62	NA
Michigan	4.96	4.56	4.48	5.10	4.92	4.82	4.94	5.04
Minnesota	5.62	5.05	4.59	5.32	4.66	4.81	5.81	6.50
Mississippi	NA	5.21	5.05	NA	6.42	5.49	5.61	6.17
Missouri	6.19	5.44	4.61	5.88	5.32	5.70	6.50	6.67
Montana	NA	4.68	5.05	5.00	R4.73	4.69	4.49	4.47
Nebraska	NA	4.93	4.56	NA	4.85	4.86	5.75	6.23
Nevada	5.83	5.90	6.48	6.63	6.16	5.78	5.76	5.54
New Hampshire	8.50	6.88	6.94	6.62	6.62	9.36	9.24	9.10
New Jersey	7.58	7.14	6.93	8.18	7.71	7.34	7.47	7.62
New Mexico	5.63	4.24	5.20	6.53	8.78	4.46	5.06	5.79
New York	NA	8.03	7.91	NA	NA	NA	NA	NA
North Carolina	8.88	6.93	6.64	8.58	8.68	9.59	8.76	8.77
North Dakota	4.37	4.31	4.38	5.17	4.18	4.14	4.32	4.43
Ohio	6.68	5.30	5.38	6.74	6.60	6.51	6.83	6.68
Oklahoma	6.07	5.03	5.11	6.80	5.96	5.66	5.79	6.44
Oregon	5.87	6.06	6.53	6.38	6.04	5.85	5.76	5.73
Pennsylvania	8.07	6.84	7.25	8.81	8.46	8.05	8.05	7.64
Rhode Island	9.27	7.80	7.51	9.70	9.67	9.39	9.18	8.79
South Carolina	8.69	7.28	7.65	8.09	8.36	9.24	8.69	8.67
South Dakota	NA	4.71	4.72	NA	4.95	4.83	5.09	5.50
Tennessee	NA	6.05	5.63	6.49	6.39	NA	7.00	6.84
Texas	6.05	5.43	5.60	6.42	5.66	5.56	6.05	6.35
Utah	4.88	4.34	4.72	5.80	4.16	5.14	4.89	4.91
Vermont	6.13	6.12	6.61	6.52	6.23	6.08	6.04	6.04
Virginia	8.40	7.15	7.05	9.05	8.12	7.56	8.46	8.87
Washington	NA	5.47	5.78	5.53	R5.50	5.48	4.89	5.39
West Virginia	6.80	6.90	6.82	7.09	6.89	6.78	6.70	6.68
Wisconsin	NA	5.82	5.84	NA	6.25	6.26	6.66	7.04
Wyoming	NA	4.16	4.72	NA	NA	4.14	4.01	3.96
Total	6.65	5.90	5.92	6.80	6.51	6.49	6.76	6.69

See footnotes at end of table.

Table 20. Average Price of Natural Gas Delivered to Residential Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996							
	Total	December	November	October	September	August	July	June
Alabama	7.20	7.34	7.82	9.68	10.60	10.95	10.74	10.53
Alaska	3.42	3.32	3.37	3.46	3.77	3.82	3.87	3.71
Arizona	7.50	6.83	7.41	9.25	10.03	10.37	9.99	9.32
Arkansas	5.90	6.62	6.03	7.03	7.72	8.27	8.41	7.85
California	6.43	6.19	6.40	6.66	5.93	6.84	8.27	6.98
Colorado	4.32	3.88	4.24	4.91	6.28	6.64	6.13	5.10
Connecticut	10.08	10.49	10.26	10.58	10.65	10.69	10.34	9.94
Delaware	7.10	7.71	7.98	9.02	10.51	10.12	10.20	8.86
District of Columbia	8.84	9.83	8.83	9.86	10.37	7.52	7.80	9.02
Florida	11.41	11.27	12.72	13.80	14.22	14.49	13.77	13.63
Georgia	6.66	6.72	5.81	8.49	10.28	10.46	10.93	11.34
Hawaii	19.91	19.60	20.81	21.05	20.57	20.60	20.91	20.22
Idaho	5.18	4.88	5.21	5.59	6.09	6.45	6.33	5.70
Illinois	5.27	5.13	5.05	5.93	8.13	9.25	8.42	8.20
Indiana	5.49	5.25	5.54	6.57	8.47	8.71	8.45	7.83
Iowa	5.56	5.78	5.37	6.74	9.26	12.82	8.98	7.96
Kansas	5.66	5.83	5.52	6.52	7.15	8.46	7.28	7.70
Kentucky	5.57	6.13	5.76	6.65	7.88	8.43	8.14	7.53
Louisiana	6.75	7.29	7.74	8.30	8.33	8.70	9.29	8.52
Maine	7.88	8.53	8.05	7.04	8.23	8.90	8.57	8.06
Maryland	7.45	7.64	7.14	8.26	10.48	10.70	10.63	9.69
Massachusetts	8.86	9.47	9.46	7.49	9.24	9.50	9.04	7.84
Michigan	4.89	4.99	4.94	5.50	6.45	7.21	7.07	6.45
Minnesota	5.46	6.17	5.46	5.47	6.65	7.66	7.49	6.69
Mississippi	5.54	6.37	6.08	6.14	6.06	6.19	6.26	6.15
Missouri	5.97	6.02	5.94	7.58	9.53	10.20	9.53	8.45
Montana	4.89	4.62	4.92	5.56	6.22	6.67	6.34	5.32
Nebraska	5.34	5.78	5.42	6.04	7.33	7.56	7.24	6.36
Nevada	6.19	5.69	6.05	7.40	7.91	8.13	7.66	7.04
New Hampshire	7.34	8.34	8.60	6.99	8.19	8.51	8.38	7.23
New Jersey	7.38	7.21	7.49	7.87	8.80	8.95	9.20	8.81
New Mexico	4.30	3.58	3.66	5.58	8.21	7.08	4.44	4.21
New York	NA	NA	NA	NA	NA	NA	10.86	9.83
North Carolina	7.57	7.88	8.19	9.90	12.48	12.77	11.10	11.45
North Dakota	4.56	4.36	4.37	5.42	6.88	7.33	7.10	5.78
Ohio	5.88	6.26	6.53	7.26	8.38	8.94	8.07	7.04
Oklahoma	5.57	5.25	5.91	8.02	9.06	9.46	9.18	8.43
Oregon	6.25	5.90	6.24	6.95	7.78	8.20	7.74	6.93
Pennsylvania	7.39	7.60	7.73	8.59	10.72	10.31	10.24	9.08
Rhode Island	8.60	8.68	9.36	9.90	11.33	11.29	11.05	9.82
South Carolina	7.62	8.07	7.71	8.44	9.52	9.99	9.84	9.09
South Dakota	5.25	5.39	5.41	5.94	7.74	11.79	8.33	6.65
Tennessee	6.33	6.18	6.00	7.17	8.54	8.87	8.54	8.40
Texas	5.77	6.04	5.24	6.97	7.73	8.24	7.87	7.21
Utah	4.47	4.75	4.81	3.79	4.15	5.19	4.99	5.40
Vermont	6.40	6.19	6.42	7.21	8.41	8.92	8.73	7.49
Virginia	7.94	8.48	8.26	9.78	11.94	12.50	12.40	10.73
Washington	5.63	5.43	5.59	6.08	6.86	7.17	6.71	6.06
West Virginia	7.05	6.83	7.04	7.58	9.26	10.28	9.77	9.21
Wisconsin	6.00	6.86	6.24	5.07	6.00	6.34	6.26	5.81
Wyoming	4.16	3.87	3.66	3.85	5.16	5.54	5.57	4.90
Total	6.29	6.39	6.31	7.00	7.94	8.62	8.55	7.75

See footnotes at end of table.

Table 20. Average Price of Natural Gas Delivered to Residential Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996					1995		
	May	April	March	February	January	Total	December	November
Alabama	8.08	6.87	6.82	6.33	5.97	6.86	5.97	6.61
Alaska	3.53	3.40	3.34	3.30	3.32	3.63	3.51	3.60
Arizona	8.67	7.57	6.97	6.80	6.60	7.82	7.04	8.18
Arkansas	6.72	5.44	5.40	5.25	5.22	5.48	4.46	5.65
California	6.38	6.00	6.20	6.32	6.47	6.42	5.92	5.78
Colorado	4.42	4.20	4.10	4.02	4.02	4.80	4.29	4.52
Connecticut	9.62	10.06	9.80	9.85	10.00	10.00	9.46	9.96
Delaware	7.78	6.70	6.38	6.25	6.32	6.60	6.09	6.83
District of Columbia	9.83	10.18	8.96	8.42	7.37	8.03	7.26	7.74
Florida	12.55	10.95	10.55	9.93	9.61	9.85	9.19	10.60
Georgia	10.43	7.30	5.54	5.97	5.06	6.18	4.98	4.79
Hawaii	20.54	19.29	19.21	18.82	18.20	17.55	18.80	17.92
Idaho	5.38	5.28	5.06	4.98	4.97	5.59	5.29	5.46
Illinois	6.76	5.51	4.91	4.55	4.24	4.66	4.18	4.10
Indiana	6.52	5.73	5.07	4.85	4.68	5.37	4.55	4.67
Iowa	6.26	5.13	4.82	4.86	4.51	5.09	4.89	4.56
Kansas	6.87	5.77	5.31	5.17	4.99	4.91	5.04	5.22
Kentucky	7.24	5.13	5.11	4.71	4.82	5.05	4.52	4.27
Louisiana	8.18	7.00	5.64	5.44	6.11	6.01	6.14	6.33
Maine	8.27	8.27	7.88	7.78	7.02	7.32	7.01	7.21
Maryland	8.38	7.19	6.99	6.83	6.47	6.62	6.19	6.50
Massachusetts	6.02	9.42	9.02	9.01	9.00	9.04	8.86	9.53
Michigan	5.12	4.72	4.37	4.53	4.45	4.72	4.49	4.64
Minnesota	5.76	5.37	4.96	4.87	4.94	4.80	4.80	4.82
Mississippi	5.96	5.46	5.36	4.75	5.26	5.28	5.18	5.47
Missouri	6.87	5.71	5.47	5.31	5.11	5.16	5.10	5.45
Montana	4.94	4.71	4.65	4.59	4.66	5.15	4.80	4.93
Nebraska	5.65	5.12	4.94	4.73	4.78	4.83	4.74	4.96
Nevada	6.68	6.22	5.86	5.76	5.64	6.76	5.97	6.92
New Hampshire	6.29	5.89	7.31	7.19	7.03	7.16	7.18	7.77
New Jersey	7.16	7.58	7.12	7.06	7.01	7.27	7.03	7.20
New Mexico	11.39	4.60	4.54	4.16	3.42	5.04	3.55	3.86
New York	8.64	8.22	7.93	8.01	7.73	8.42	7.77	8.70
North Carolina	9.04	7.29	7.52	6.81	6.13	6.93	6.21	6.50
North Dakota	4.46	4.43	4.31	4.20	4.28	4.66	4.29	4.50
Ohio	6.31	5.37	5.33	5.38	4.92	5.46	4.97	5.01
Oklahoma	6.87	5.21	5.09	4.76	4.74	5.56	5.04	5.84
Oregon	6.50	6.34	6.17	5.67	6.05	6.74	6.32	6.75
Pennsylvania	8.21	7.38	6.73	6.68	6.42	7.16	5.60	6.42
Rhode Island	8.39	7.92	8.06	7.88	7.97	8.02	7.89	8.70
South Carolina	8.12	6.97	7.68	7.40	7.02	7.54	6.76	6.84
South Dakota	5.65	5.21	4.36	4.67	4.43	5.05	4.86	5.07
Tennessee	7.34	6.70	6.51	6.04	5.53	5.77	6.26	4.31
Texas	6.81	5.98	5.32	5.06	4.84	5.92	5.23	5.77
Utah	4.59	3.90	4.94	3.97	4.51	4.74	4.72	4.99
Vermont	6.59	6.24	6.09	6.02	5.98	6.82	6.09	6.88
Virginia	8.78	7.53	6.88	7.23	6.83	7.18	6.44	5.55
Washington	5.71	5.59	5.44	5.38	5.41	5.89	5.57	5.68
West Virginia	7.55	6.94	6.74	6.69	6.67	7.05	6.67	6.91
Wisconsin	5.56	5.90	5.87	5.75	5.90	5.82	5.88	5.74
Wyoming	4.47	4.31	4.19	3.94	4.14	4.83	NA	NA
Total	6.77	6.22	5.89	5.78	5.60	6.06	5.54	5.61

R = Revised Data.
NA = Not Available.

Notes: Data for 1995 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 21. Average Price of Natural Gas Sold to Commercial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997				
				May	April	March	February	January
Alabama	7.02	5.90	5.86	6.85	7.18	7.26	6.92	6.97
Alaska	2.48	2.33	2.33	2.23	2.37	2.32	2.62	2.63
Arizona	5.11	4.93	5.39	5.19	5.09	5.27	5.03	5.01
Arkansas	5.12	4.40	4.07	5.14	4.90	4.86	5.07	5.42
California	6.58	6.35	6.44	5.33	6.10	6.71	6.98	7.18
Colorado	NA	3.64	4.27	NA	NA	NA	NA	NA
Connecticut	7.82	7.72	7.69	7.00	7.24	7.66	8.45	8.09
Delaware	6.49	5.45	5.23	6.80	6.59	6.52	6.49	6.27
District of Columbia	8.16	7.14	6.15	6.87	10.06	7.61	8.03	8.30
Florida	6.75	6.49	5.25	6.74	6.65	6.96	6.84	6.56
Georgia	6.55	5.59	5.62	6.30	5.57	7.53	6.66	6.44
Hawaii	NA	13.69	12.72	15.25	R15.34	15.72	15.07	14.79
Idaho	4.39	4.50	4.79	4.60	4.62	4.36	4.29	4.30
Illinois	5.42	4.55	4.49	4.93	4.64	4.97	5.68	5.89
Indiana	5.46	4.32	4.58	6.15	5.97	5.37	5.43	5.14
Iowa	4.93	4.07	3.99	4.88	4.34	4.81	5.32	4.96
Kansas	5.80	4.99	3.94	5.28	5.23	5.46	6.25	5.98
Kentucky	5.71	4.61	4.70	5.53	5.82	5.72	5.80	5.64
Louisiana	6.28	5.83	5.01	6.09	5.09	5.78	6.49	7.09
Maine	7.89	6.99	6.67	6.67	8.28	8.10	8.12	7.75
Maryland	NA	5.80	4.96	NA	NA	NA	NA	NA
Massachusetts	NA	7.06	7.02	5.44	7.94	8.14	8.28	NA
Michigan	4.81	4.48	4.33	4.82	4.63	4.71	4.80	4.99
Minnesota	4.90	4.40	3.96	3.99	3.89	4.16	5.23	6.02
Mississippi	NA	5.47	4.51	NA	4.93	5.04	5.58	5.61
Missouri	5.82	5.13	4.17	4.39	4.55	5.07	6.47	6.58
Montana	NA	4.62	4.90	4.81	R4.52	4.57	4.45	4.46
Nebraska	NA	4.45	4.23	NA	NA	4.23	2.54	6.00
Nevada	4.99	4.86	5.40	5.12	5.18	4.95	4.86	4.97
New Hampshire	7.99	6.60	6.49	5.86	6.52	8.67	8.81	8.41
New Jersey	6.59	7.57	5.71	5.64	5.57	7.00	7.10	6.70
New Mexico	4.50	3.24	4.12	4.23	4.63	3.54	4.35	5.34
New York	NA	NA	6.29	NA	NA	NA	NA	NA
North Carolina	7.33	5.92	5.31	6.02	6.50	7.85	7.67	7.52
North Dakota	4.00	3.85	3.83	4.29	3.71	3.65	4.09	4.24
Ohio	6.35	4.97	4.96	6.08	6.18	6.03	6.74	6.41
Oklahoma	5.66	4.49	4.53	4.97	4.81	5.26	5.75	6.40
Oregon	4.57	4.87	5.21	4.62	4.61	4.57	4.55	4.56
Pennsylvania	7.41	6.14	6.44	7.68	7.71	7.37	7.55	7.07
Rhode Island	8.14	6.92	6.42	8.07	8.46	8.17	8.20	7.88
South Carolina	7.14	6.32	6.41	5.92	6.74	7.20	7.54	7.46
South Dakota	NA	3.88	3.78	NA	4.04	3.96	4.28	4.61
Tennessee	NA	5.66	5.25	5.39	5.01	NA	6.19	6.51
Texas	NA	4.35	4.26	NA	4.29	NA	5.31	NA
Utah	3.65	3.30	3.62	3.37	3.09	3.81	3.75	3.81
Vermont	5.23	5.24	5.52	5.58	5.10	5.21	5.21	5.24
Virginia	6.53	5.53	5.17	6.31	6.29	5.92	6.81	6.97
Washington	NA	4.75	5.07	4.78	R4.26	4.71	—	4.65
West Virginia	6.24	6.21	6.07	6.75	6.41	6.21	R6.12	6.09
Wisconsin	NA	4.71	4.61	NA	5.00	5.10	5.62	5.98
Wyoming	NA	3.73	4.32	NA	NA	3.47	3.45	3.38
Total	5.81	5.29	5.14	5.39	5.45	5.69	5.98	6.07

See footnotes at end of table.

Table 21. Average Price of Natural Gas Sold to Commercial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996							
	Total	December	November	October	September	August	July	June
Alabama	6.18	6.49	6.30	6.59	6.80	6.87	6.81	6.98
Alaska	2.29	2.36	2.31	2.20	2.00	1.87	2.13	2.19
Arizona	4.98	4.95	4.98	5.12	5.15	5.11	5.06	4.96
Arkansas	4.68	5.58	5.01	4.71	4.86	4.85	4.97	5.11
California	6.02	6.43	5.55	5.75	5.52	5.31	5.56	5.48
Colorado	3.57	3.23	3.32	3.66	3.82	3.92	3.80	3.69
Connecticut	7.37	7.86	7.80	6.17	5.90	5.67	5.86	6.45
Delaware	5.77	6.14	5.95	6.34	6.40	6.83	6.88	6.77
District of Columbia	7.09	7.71	7.72	7.63	7.07	5.65	5.60	6.08
Florida	6.47	6.49	6.44	6.42	6.39	6.40	6.46	6.54
Georgia	5.82	6.26	5.66	6.01	5.80	5.81	6.50	6.99
Hawaii	14.52	15.25	15.43	15.48	14.74	15.06	15.46	14.76
Idaho	4.55	4.33	4.62	4.85	4.90	4.91	4.92	4.77
Illinois	4.91	5.19	4.82	5.22	6.24	7.64	7.07	6.66
Indiana	4.58	4.56	4.63	4.98	5.87	5.84	5.84	5.69
Iowa	4.62	5.19	5.13	5.36	5.65	8.76	6.02	5.15
Kansas	5.13	5.45	5.07	5.21	6.05	6.65	4.14	5.15
Kentucky	5.04	5.62	5.45	5.74	5.89	6.28	5.76	5.57
Louisiana	6.08	6.86	6.57	6.14	5.88	6.10	6.62	6.09
Maine	7.09	7.87	7.58	6.17	6.55	6.57	7.96	6.44
Maryland	5.90	6.42	5.53	5.71	6.09	6.32	6.16	6.16
Massachusetts	6.71	7.85	7.25	4.75	4.84	4.83	5.02	4.74
Michigan	4.69	4.91	4.79	5.18	5.45	6.02	5.85	5.52
Minnesota	4.62	5.66	4.58	3.98	4.26	4.95	4.88	4.67
Mississippi	5.11	5.61	4.76	4.22	4.16	4.05	4.23	4.24
Missouri	5.34	5.81	5.30	5.34	5.92	6.35	6.00	5.61
Montana	4.72	4.56	4.76	5.15	5.36	5.41	5.26	4.83
Nebraska	4.47	5.38	4.03	4.93	3.35	4.37	4.16	4.26
Nevada	4.91	4.88	4.89	5.13	5.14	5.10	4.92	4.92
New Hampshire	6.76	7.75	7.78	5.86	6.14	6.23	6.29	5.91
New Jersey	7.03	7.22	6.53	5.27	4.90	5.12	5.16	5.24
New Mexico	3.18	3.18	2.99	3.23	3.96	3.24	2.67	2.60
New York	NA	NA	NA	NA	NA	NA	NA	NA
North Carolina	6.15	6.71	6.65	6.33	6.37	6.35	7.11	5.65
North Dakota	3.96	4.08	3.58	3.80	4.22	4.93	6.39	4.49
Ohio	5.38	5.81	6.14	6.42	6.66	6.87	6.28	5.94
Oklahoma	4.65	5.00	4.76	5.03	5.06	5.07	4.65	4.95
Oregon	4.86	4.67	4.84	5.11	5.13	5.11	5.11	4.85
Pennsylvania	6.38	6.75	6.46	6.78	7.39	7.26	7.24	6.91
Rhode Island	7.28	7.71	7.60	8.04	7.76	7.76	7.92	7.53
South Carolina	[R]6.26	7.01	6.37	5.66	5.76	5.74	5.69	[R]5.80
South Dakota	4.21	4.34	4.20	4.07	5.22	8.54	5.68	5.55
Tennessee	5.75	5.72	5.34	5.55	6.10	6.45	5.96	6.13
Texas	NA	5.47	4.65	NA	4.44	NA	3.92	3.90
Utah	3.38	3.69	3.80	2.96	3.07	3.32	3.25	3.34
Vermont	5.23	5.19	5.10	5.10	5.18	5.43	5.44	5.55
Virginia	5.85	6.65	5.86	6.00	6.38	6.56	6.64	6.17
Washington	4.79	4.74	4.77	4.86	5.01	5.08	5.14	4.75
West Virginia	6.02	5.84	6.24	5.81	6.25	4.84	4.66	8.05
Wisconsin	4.77	5.71	4.97	3.72	4.01	4.38	4.71	4.25
Wyoming	3.44	2.89	2.44	3.50	3.81	3.66	3.87	3.85
Total	5.38	5.74	5.38	5.30	5.44	5.54	5.43	5.37

See footnotes at end of table.

Table 21. Average Price of Natural Gas Sold to Commercial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996					1995		
	May	April	March	February	January	Total	December	November
Alabama	6.40	6.07	6.20	5.77	5.62	5.80	5.48	5.53
Alaska	2.24	2.37	2.34	2.43	2.33	2.27	2.34	2.23
Arizona	4.92	4.97	4.94	4.95	4.90	5.25	4.91	5.10
Arkansas	4.84	4.47	4.34	4.37	4.31	4.09	3.89	4.27
California	5.61	6.05	6.68	6.26	6.82	6.21	7.01	4.67
Colorado	3.54	3.59	3.73	3.59	3.61	4.23	3.78	3.87
Connecticut	7.25	7.72	7.69	8.29	7.37	7.57	8.53	7.48
Delaware	6.02	5.48	5.60	5.30	5.29	5.28	4.97	5.64
District of Columbia	6.04	6.63	8.41	7.83	6.57	6.04	6.01	6.40
Florida	6.63	6.62	6.68	6.39	6.20	5.33	5.66	5.43
Georgia	7.00	5.90	5.41	5.62	5.16	5.20	4.72	4.21
Hawaii	14.53	13.69	13.95	13.50	12.92	13.00	13.46	13.19
Idaho	4.77	4.66	4.42	4.41	4.45	4.87	4.69	5.22
Illinois	6.18	4.99	4.74	4.30	4.06	4.42	4.00	4.11
Indiana	5.27	4.94	4.36	4.18	4.04	4.39	3.93	3.75
Iowa	4.48	3.87	4.13	4.07	4.01	4.14	4.05	4.10
Kansas	5.26	4.85	5.16	5.04	4.81	3.93	4.12	4.07
Kentucky	5.72	4.87	4.54	4.49	4.45	4.60	4.38	4.13
Louisiana	6.53	6.39	5.45	5.33	6.07	5.14	5.85	5.50
Maine	6.31	7.22	7.32	7.32	6.51	6.51	6.48	6.58
Maryland	5.95	5.54	5.97	6.03	5.57	5.06	5.16	5.00
Massachusetts	4.27	7.35	7.39	7.50	7.51	6.59	7.25	6.57
Michigan	4.72	4.51	4.46	4.46	4.41	4.46	4.39	4.49
Minnesota	4.52	4.43	4.37	4.37	4.44	3.98	4.24	3.95
Mississippi	12.58	4.74	4.73	4.43	4.87	4.25	4.68	4.50
Missouri	5.39	5.13	5.26	5.17	4.96	4.39	4.76	4.69
Montana	4.74	4.60	4.61	4.58	4.63	4.92	4.65	4.78
Nebraska	5.40	4.34	4.37	4.53	4.20	3.96	NA	NA
Nevada	4.93	4.90	4.86	4.84	4.80	5.39	4.88	5.31
New Hampshire	5.76	5.79	7.00	6.94	6.67	6.44	6.70	6.48
New Jersey	5.59	6.19	6.75	6.67	10.42	5.76	6.12	6.81
New Mexico	3.93	3.19	3.38	3.40	2.99	3.74	2.94	3.00
New York	NA	NA	NA	NA	NA	6.09	6.16	5.51
North Carolina	6.22	5.83	6.34	6.10	5.39	5.24	5.19	5.18
North Dakota	3.88	3.89	3.78	3.87	3.84	3.90	3.77	3.74
Ohio	5.60	5.00	5.02	5.07	4.68	4.92	4.69	4.66
Oklahoma	4.93	4.24	4.60	4.46	4.48	4.47	4.47	4.33
Oregon	4.83	4.94	4.83	4.82	4.83	5.23	4.98	5.34
Pennsylvania	6.62	6.62	6.07	6.05	5.89	6.28	5.60	5.62
Rhode Island	7.12	6.07	7.29	7.26	7.04	6.41	6.94	5.94
South Carolina	R5.87	6.05	6.49	6.66	6.22	6.09	5.78	5.77
South Dakota	4.72	4.36	3.47	4.04	3.54	3.99	3.91	3.85
Tennessee	6.03	6.02	5.99	5.81	5.26	5.18	5.02	4.88
Texas	3.90	3.98	4.32	4.32	4.45	4.09	4.31	4.17
Utah	3.01	2.86	3.69	3.06	3.59	3.65	3.92	3.91
Vermont	5.37	5.23	5.18	5.23	5.27	5.43	5.13	5.23
Virginia	5.10	5.58	5.37	5.86	5.46	5.08	4.92	4.52
Washington	4.76	4.78	4.74	4.74	4.73	5.00	4.89	4.89
West Virginia	6.81	6.32	6.09	6.02	6.00	6.08	6.09	6.04
Wisconsin	4.12	4.79	4.73	4.65	4.78	4.50	4.72	4.43
Wyoming	3.73	3.78	3.83	3.56	3.80	4.23	NA	NA
Total	R5.35	5.29	5.31	5.24	5.30	5.05	5.00	4.77

R = Revised Data.
NA = Not Available.
— = Not Applicable.

Notes: Data for 1995 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Average prices for gas delivered to commercial consumers reflect onsystem sales prices only. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy. See Table 24 for data on onsystem sales expressed as a percentage of both total commercial and total industrial deliveries.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 22. Average Price of Natural Gas Sold to Industrial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997				
				May	April	March	February	January
Alabama	3.56	3.78	3.04	3.19	2.99	3.15	3.91	4.73
Alaska	1.53	1.51	1.44	1.44	1.53	1.55	1.57	1.55
Arizona	4.05	3.91	3.62	3.90	4.31	4.06	3.71	4.32
Arkansas	3.63	3.00	2.90	3.17	3.19	3.31	3.78	4.45
California	4.12	3.70	3.87	2.50	3.45	4.24	5.30	5.40
Colorado	NA	1.77	NA	NA	NA	NA	NA	NA
Connecticut	5.13	5.23	4.69	4.22	4.46	4.91	5.76	6.11
Delaware	4.49	4.05	3.03	3.88	3.86	4.52	5.09	5.29
District of Columbia	—	—	—	—	—	—	—	—
Florida	4.50	4.34	3.19	4.28	4.34	4.42	4.68	4.69
Georgia	5.34	4.43	3.57	4.79	4.39	5.07	5.69	6.45
Hawaii	—	—	—	—	—	—	—	—
Idaho [a]	2.75	3.18	3.80	2.72	2.73	2.74	2.76	2.78
Illinois	5.02	3.97	3.79	3.00	4.10	4.80	5.86	6.49
Indiana	4.33	3.21	3.33	4.50	4.67	4.41	4.21	4.19
Iowa	3.97	3.29	3.19	3.96	3.14	4.04	4.73	3.94
Kansas	2.97	2.50	2.21	2.57	2.32	2.34	3.45	4.36
Kentucky	4.34	3.77	3.37	3.73	3.79	3.97	4.67	4.89
Louisiana	NA	2.89	1.77	NA	2.78	2.69	NA	4.19
Maine	6.09	5.96	4.95	4.10	5.77	7.08	7.10	6.95
Maryland	NA	5.21	3.41	NA	NA	NA	NA	NA
Massachusetts	NA	6.17	5.51	4.63	6.35	7.12	8.35	NA
Michigan	4.13	4.01	3.56	4.24	4.12	4.15	4.02	4.16
Minnesota	3.30	2.88	2.64	2.67	2.58	2.74	3.73	4.69
Mississippi	NA	3.42	2.87	NA	2.98	3.41	4.17	4.45
Missouri	4.78	4.55	3.49	3.45	3.74	4.48	5.94	5.35
Montana	NA	4.79	4.81	4.85	[R]4.84	4.84	0.51	4.79
Nebraska	3.75	3.13	2.90	2.77	2.66	3.19	4.14	5.16
Nevada	6.17	4.94	5.47	7.77	5.80	4.67	4.64	9.50
New Hampshire	4.91	4.83	4.35	3.12	4.02	6.10	7.97	7.94
New Jersey	4.13	4.17	3.32	3.05	2.87	4.79	5.03	4.89
New Mexico	4.17	2.96	4.51	6.61	5.10	3.40	4.02	3.01
New York	NA	5.21	4.87	NA	NA	NA	NA	NA
North Carolina	5.11	4.38	3.63	4.01	4.14	4.80	5.41	5.63
North Dakota	3.04	3.31	2.89	2.42	2.37	1.60	4.94	4.39
Ohio	5.76	4.57	4.04	4.50	5.96	5.49	6.71	5.52
Oklahoma	4.23	2.86	2.41	2.75	3.08	3.90	4.53	5.41
Oregon	3.21	3.21	3.44	3.15	3.16	3.25	3.24	3.25
Pennsylvania	4.97	4.28	3.65	4.49	4.80	4.91	5.25	5.25
Rhode Island	4.56	4.76	4.72	4.72	3.56	4.50	5.52	5.64
South Carolina	3.75	3.90	3.17	3.26	3.21	3.43	4.22	4.74
South Dakota	NA	1.97	3.19	NA	3.12	3.00	4.00	4.99
Tennessee	NA	3.80	3.60	3.19	3.18	NA	4.75	4.80
Texas	2.76	2.48	1.67	2.31	2.06	1.99	3.28	4.11
Utah	2.40	2.05	2.53	2.27	2.32	2.53	2.44	2.44
Vermont	3.12	3.61	3.44	3.05	2.98	3.14	3.14	3.32
Virginia	4.13	4.45	3.96	4.03	3.11	4.79	6.00	3.56
Washington	NA	2.50	2.79	2.96	[R]2.88	2.88	3.29	4.36
West Virginia	2.98	2.80	2.59	2.95	2.49	2.78	3.08	3.44
Wisconsin	4.04	3.74	3.15	3.08	3.73	3.50	4.26	4.89
Wyoming	NA	3.01	3.34	NA	NA	NA	NA	NA
Total	3.68	3.40	2.74	2.96	3.03	3.35	4.22	4.59

See footnotes at end of table.

Table 22. Average Price of Natural Gas Sold to Industrial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996							
	Total	December	November	October	September	August	July	June
Alabama	3.72	4.56	3.76	3.30	3.12	3.62	3.57	3.44
Alaska	1.52	1.54	1.50	1.51	1.48	1.54	1.55	1.54
Arizona	3.86	3.87	3.86	3.84	3.82	3.74	3.64	3.90
Arkansas	3.06	3.93	3.39	2.75	2.74	2.77	3.03	2.92
California	3.69	4.26	3.92	3.29	3.53	3.48	3.54	3.29
Colorado	2.04	3.63	2.90	1.92	1.70	1.76	1.72	1.71
Connecticut	4.80	5.81	4.95	4.00	3.98	3.83	4.02	4.07
Delaware	4.38	5.00	4.77	4.68	4.64	4.77	4.73	4.35
District of Columbia	—	—	—	—	—	—	—	—
Florida	4.30	4.66	4.39	4.05	3.96	4.19	4.22	4.24
Georgia	4.59	5.09	3.93	4.33	2.86	4.24	6.99	5.67
Hawaii	—	—	—	—	—	—	—	—
Idaho [a]	3.02	2.63	2.73	3.00	2.99	2.98	3.18	3.04
Illinois	4.14	4.18	4.12	4.20	5.07	5.01	4.84	5.37
Indiana	3.42	3.71	3.48	3.51	3.94	3.94	3.68	3.85
Iowa	3.61	3.94	3.79	3.43	3.91	3.54	4.41	4.26
Kansas	2.32	4.23	3.28	2.28	2.86	2.51	2.56	2.65
Kentucky	3.87	4.66	3.89	3.68	3.61	3.85	3.71	3.59
Louisiana	2.81	4.03	2.92	2.20	2.20	2.35	2.76	2.69
Maine	5.31	6.71	6.67	4.11	4.03	4.03	4.22	4.02
Maryland	5.43	4.66	6.09	7.92	6.28	7.50	6.45	6.17
Massachusetts	5.45	7.10	5.62	4.22	3.81	3.77	4.05	3.80
Michigan	4.10	4.17	4.18	4.34	4.30	4.47	4.57	4.12
Minnesota	2.95	4.23	3.18	2.43	2.35	2.96	2.72	2.55
Mississippi	[R]3.38	4.38	3.52	[R]2.82	2.98	3.15	3.37	3.17
Missouri	4.35	4.86	4.03	3.76	4.14	4.29	4.25	3.89
Montana	4.88	4.87	4.95	5.02	5.04	5.16	5.09	5.01
Nebraska	3.30	4.32	3.63	2.76	2.87	3.41	3.21	3.10
Nevada	4.90	4.67	4.68	5.01	5.10	5.15	4.80	4.86
New Hampshire	4.87	6.93	5.20	7.74	3.53	3.39	3.51	3.43
New Jersey	3.78	4.53	3.43	3.02	3.38	3.09	3.44	3.42
New Mexico	2.74	2.50	2.63	2.75	3.36	3.27	2.75	2.56
New York	[R]4.94	5.07	4.69	4.36	4.31	4.61	4.64	4.54
North Carolina	4.35	5.13	4.63	4.04	4.02	3.81	3.86	3.63
North Dakota	3.07	3.96	2.40	2.32	2.75	3.02	3.38	3.05
Ohio	4.90	5.38	5.58	5.43	5.06	5.33	5.56	4.55
Oklahoma	3.07	3.66	3.13	3.00	3.32	3.10	3.21	3.37
Oregon	3.23	3.31	3.38	3.10	3.18	3.23	3.32	3.25
Pennsylvania	4.24	4.55	4.32	4.09	4.08	3.98	3.93	4.08
Rhode Island	4.61	9.56	4.58	3.67	3.69	3.79	4.26	3.86
South Carolina	3.74	4.52	3.98	3.25	3.26	3.44	3.53	3.35
South Dakota	2.57	4.51	3.52	3.46	4.05	3.85	3.52	3.98
Tennessee	3.80	4.23	3.63	3.30	3.77	3.90	3.58	3.69
Texas	2.61	4.03	3.06	2.07	2.09	2.55	2.77	2.63
Utah	2.03	2.20	2.14	1.90	1.93	1.96	1.90	1.95
Vermont	3.43	3.17	3.19	3.43	3.16	3.30	3.36	3.54
Virginia	4.28	4.43	3.77	4.05	4.33	4.42	3.96	4.13
Washington	2.70	3.85	2.81	2.55	1.95	3.88	2.38	2.82
West Virginia	2.87	3.06	3.17	2.80	2.92	2.50	2.70	2.82
Wisconsin	3.75	5.10	4.37	2.94	3.02	3.36	3.52	3.34
Wyoming	3.01	3.12	3.19	3.16	3.06	3.02	2.97	2.85
Total	3.35	4.25	3.58	[R]2.84	2.83	3.06	3.19	3.12

See footnotes at end of table.

Table 22. Average Price of Natural Gas Sold to Industrial Consumers, by State, 1995-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996					1995		
	May	April	March	February	January	Total	December	November
Alabama	3.38	3.68	3.84	4.10	3.90	2.96	3.16	3.05
Alaska	1.52	1.51	1.52	1.50	1.50	1.45	1.42	1.43
Arizona	3.90	3.90	3.92	3.94	3.91	3.81	4.68	3.99
Arkansas	2.93	2.95	3.04	2.95	3.09	2.78	2.99	2.84
California	3.28	3.61	3.69	3.89	4.35	3.70	3.89	2.71
Colorado	1.75	1.70	1.91	1.72	1.80	2.86	NA	NA
Connecticut	4.21	4.69	5.21	5.68	6.52	4.39	5.41	4.41
Delaware	4.85	4.04	3.93	4.15	3.79	2.94	3.78	2.88
District of Columbia	—	—	—	—	—	—	—	—
Florida	4.17	4.62	4.26	4.57	4.16	3.28	2.94	3.44
Georgia	4.68	4.28	4.72	4.79	4.84	3.55	3.73	3.27
Hawaii	—	—	—	—	—	—	—	—
Idaho [a]	3.09	3.00	3.18	3.17	3.47	3.67	3.93	3.82
Illinois	4.58	3.27	4.66	3.84	3.59	3.57	3.32	3.22
Indiana	2.49	3.66	3.37	3.53	3.04	3.41	3.54	3.28
Iowa	3.55	3.08	3.35	3.39	3.20	3.23	1.77	3.12
Kansas	2.52	2.27	2.82	2.49	0.78	2.23	2.55	2.39
Kentucky	3.73	3.75	3.82	3.85	3.93	3.26	3.51	3.18
Louisiana	2.54	2.82	3.01	2.75	3.28	1.82	2.27	1.90
Maine	5.12	6.27	6.38	6.50	5.60	4.46	5.43	4.54
Maryland	6.15	5.47	5.19	5.89	4.17	3.21	1.24	4.83
Massachusetts	4.15	5.91	6.52	7.00	6.89	4.43	5.05	4.70
Michigan	3.93	3.92	4.06	4.05	4.04	3.62	3.58	3.63
Minnesota	2.77	2.72	2.90	3.11	2.98	2.45	2.55	2.48
Mississippi	3.09	3.41	3.51	3.20	3.75	2.71	3.46	3.01
Missouri	3.98	4.22	4.92	4.58	4.31	3.48	4.19	3.58
Montana	4.65	4.84	4.74	4.72	4.94	4.87	4.86	4.88
Nebraska	2.93	3.14	3.11	3.20	3.20	2.79	2.91	2.38
Nevada	4.90	4.91	4.96	4.98	4.93	5.34	4.92	5.15
New Hampshire	3.62	4.27	5.43	6.08	5.23	3.80	4.97	3.79
New Jersey	3.66	4.13	4.19	4.83	4.11	3.11	3.53	3.22
New Mexico	3.15	3.01	4.31	3.74	2.30	2.83	1.71	2.21
New York	4.81	5.29	[R]5.23	5.54	5.07	4.69	4.94	4.62
North Carolina	3.83	3.89	4.60	5.02	4.40	3.56	4.03	3.66
North Dakota	3.22	3.34	3.14	3.34	3.44	2.90	3.18	2.94
Ohio	4.73	4.78	4.70	4.38	4.51	3.93	3.91	3.99
Oklahoma	2.90	2.83	2.90	2.87	2.82	2.27	2.67	2.50
Oregon	3.20	3.14	3.27	3.25	3.19	3.41	3.25	3.46
Pennsylvania	4.05	4.24	4.24	4.37	4.41	3.90	3.56	3.44
Rhode Island	4.08	4.42	5.58	5.40	4.68	4.09	4.83	3.33
South Carolina	3.39	3.74	3.97	4.20	4.35	3.11	3.64	3.26
South Dakota	3.39	3.33	1.48	2.11	3.08	3.44	3.20	2.76
Tennessee	3.76	3.98	3.93	4.29	3.48	3.34	3.38	3.16
Texas	2.40	2.54	2.36	2.60	2.45	1.89	2.17	1.81
Utah	1.98	2.00	2.27	1.75	2.26	2.34	2.07	2.20
Vermont	3.73	3.74	3.53	3.62	3.45	3.39	2.98	3.27
Virginia	3.81	5.13	4.31	4.61	4.52	3.35	3.50	2.83
Washington	2.50	2.49	2.56	2.66	2.41	2.74	2.98	2.84
West Virginia	2.75	2.97	2.99	2.93	2.70	2.60	2.77	2.92
Wisconsin	3.29	3.74	3.69	3.64	3.83	2.96	3.57	3.16
Wyoming	3.15	3.09	3.11	2.54	3.14	3.18	NA	NA
Total	3.07	3.34	3.51	3.54	3.46	2.71	3.07	2.68

[R] = Revised Data.
NA = Not Available.
— = Not Applicable.

Notes: Data for 1995 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. Average prices for gas delivered to industrial consumers reflect onsystem sales prices only. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy. See Table 24 for data on onsystem sales expressed as a percentage of both total commercial and total industrial deliveries.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Table 23. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers, by State, 1996-1997

(Dollars per Thousand Cubic Feet)

State	YTD 1997	YTD 1996	YTD 1995	1997				1996
				April	March	February	January	Total
Alabama	2.95	3.20	1.99	3.21	2.12	2.04	4.37	2.95
Alaska	1.63	1.27	1.32	1.63	1.55	1.69	1.68	1.45
Arizona	4.10	2.60	1.65	4.47	2.85	4.01	5.70	3.03
Arkansas	2.72	2.91	1.53	1.98	1.60	1.92	4.18	2.52
California	3.45	2.77	2.37	2.63	3.04	4.14	4.67	2.75
Colorado	3.00	1.87	1.66	2.47	2.26	3.32	3.76	2.09
Connecticut	2.67	2.79	2.10	2.22	2.45	3.08	3.97	2.76
Delaware	3.16	4.08	2.34	2.53	2.61	2.90	4.87	3.13
District of Columbia	—	—	—	—	—	—	—	—
Florida	2.45	3.35	2.04	2.26	2.05	2.13	4.60	3.12
Georgia	3.00	5.26	3.96	2.64	3.34	8.15	2.08	2.88
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	2.36	3.11	1.56	2.12	2.00	2.93	3.34	2.62
Indiana	3.48	3.65	2.50	2.88	2.74	3.74	5.04	3.48
Iowa	3.48	4.16	2.87	2.79	2.73	3.74	5.11	3.23
Kansas	2.71	2.33	1.65	2.00	1.80	2.92	4.56	2.25
Kentucky	3.69	3.70	2.76	3.13	3.20	3.69	4.85	3.49
Louisiana	2.83	3.50	1.78	2.18	2.10	2.93	4.35	2.94
Maine	—	—	—	—	—	—	—	—
Maryland	3.54	5.15	2.53	3.14	4.18	5.75	5.04	3.11
Massachusetts	2.97	4.23	2.11	2.54	2.64	3.29	5.37	3.07
Michigan	0.62	0.76	0.75	0.61	0.69	0.59	0.56	0.74
Minnesota	2.32	2.37	1.87	2.34	2.17	3.35	2.26	2.18
Mississippi	2.81	4.37	1.68	2.27	2.08	2.61	4.15	2.78
Missouri	3.50	2.87	1.52	2.77	2.26	4.62	5.41	2.58
Montana	4.89	8.78	15.50	2.87	4.08	9.68	3.54	2.89
Nebraska	2.37	2.10	1.85	1.89	2.29	3.20	3.22	2.07
Nevada	2.09	2.10	1.67	2.02	2.05	2.33	2.14	2.12
New Hampshire	—	—	1.85	—	—	—	—	—
New Jersey	3.06	2.99	1.81	2.69	2.57	3.60	4.65	2.96
New Mexico	2.66	2.16	1.56	2.07	2.01	2.85	4.07	2.31
New York	2.98	3.79	2.20	2.53	2.56	3.35	4.36	2.96
North Carolina	2.84	3.08	2.66	2.79	—	—	6.89	3.11
North Dakota	3.31	3.58	3.67	3.98	2.93	—	—	2.93
Ohio	4.01	3.76	2.45	4.06	4.03	4.16	3.87	3.44
Oklahoma	3.42	3.42	2.33	2.57	2.88	4.36	4.21	2.98
Oregon	1.73	—	1.43	—	1.40	—	1.96	1.33
Pennsylvania	3.10	3.92	2.35	2.31	2.72	2.91	4.65	2.85
Rhode Island	3.25	2.39	—	2.82	2.90	4.09	3.18	2.29
South Carolina	4.10	4.48	1.47	3.87	2.84	4.22	6.95	4.56
South Dakota	—	—	—	—	—	—	—	—
Tennessee	—	—	—	—	—	—	—	—
Texas	2.75	2.47	1.91	2.14	2.12	2.85	3.89	2.51
Utah	—	20.25	2.67	—	—	—	—	—
Vermont	3.15	2.81	1.87	2.27	2.61	3.60	5.05	3.22
Virginia	2.74	2.36	2.69	2.71	2.76	1.80	3.13	2.98
Washington	6.99	5.17	4.80	5.93	65.04	4.50	5.11	4.98
West Virginia	5.00	3.74	3.83	3.63	3.82	7.68	3.15	2.99
Wisconsin	3.06	3.18	2.29	2.46	2.33	3.42	4.74	3.04
Wyoming	15.06	18.37	8.77	24.02	22.85	2.47	13.99	12.59
Total	2.81	2.83	2.00	2.30	2.30	2.98	4.04	2.69

See footnotes at end of table.

Table 23. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers, by State, 1996-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996							
	December	November	October	September	August	July	June	May
Alabama	4.32	3.16	2.27	2.14	2.66	3.04	2.71	2.59
Alaska	1.64	1.63	1.73	1.71	1.66	1.58	1.47	1.04
Arizona	7.53	4.76	2.53	2.98	2.61	3.09	3.33	4.43
Arkansas	3.88	2.62	1.36	1.89	2.47	2.57	2.40	2.30
California	4.55	3.40	2.60	2.51	2.63	2.32	2.41	2.59
Colorado	4.30	2.93	2.47	1.54	1.72	2.32	1.52	1.85
Connecticut	4.97	3.26	2.78	2.30	2.78	3.01	2.69	2.62
Delaware	4.06	3.65	2.32	2.32	2.35	3.39	3.01	3.19
District of Columbia	—	—	—	—	—	—	—	—
Florida	4.75	3.38	2.56	2.59	2.99	3.28	3.09	2.91
Georgia	6.28	2.50	3.08	2.72	2.51	2.23	3.25	3.80
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	3.82	3.10	2.12	1.98	2.25	2.70	2.60	2.43
Indiana	4.80	3.86	3.38	2.99	2.95	3.14	3.32	3.21
Iowa	3.77	3.45	2.95	1.80	2.87	2.83	2.55	2.64
Kansas	4.10	2.62	1.88	1.81	2.35	2.19	2.16	2.13
Kentucky	4.64	3.51	2.82	2.59	3.05	3.36	3.15	3.78
Louisiana	4.37	3.12	2.25	2.16	2.64	2.96	2.72	2.63
Maine	—	—	—	—	—	—	—	—
Maryland	5.92	4.02	2.65	2.85	2.49	3.25	3.12	3.13
Massachusetts	4.85	3.85	2.69	2.33	2.71	3.37	3.03	3.08
Michigan	0.55	0.73	0.55	0.59	0.91	0.73	0.88	0.90
Minnesota	2.32	2.19	2.14	2.14	2.10	2.14	2.09	2.36
Mississippi	4.27	3.23	2.10	2.00	2.52	2.85	2.64	2.49
Missouri	4.90	2.61	2.38	2.24	2.41	2.63	2.50	2.42
Montana	1.81	1.66	0.65	6.59	6.79	3.49	4.69	5.95
Nebraska	4.37	2.85	1.85	1.81	2.16	2.27	1.74	1.58
Nevada	2.19	2.37	2.71	1.96	2.20	1.83	2.06	1.90
New Hampshire	—	—	—	—	—	—	—	—
New Jersey	4.39	3.16	2.36	2.42	2.79	3.15	3.14	3.37
New Mexico	3.80	2.94	2.17	1.94	2.33	2.01	1.99	2.04
New York	4.22	3.39	2.37	2.26	2.74	3.06	2.89	2.80
North Carolina	4.41	4.20	2.55	2.80	3.31	3.51	2.93	2.66
North Dakota	2.81	3.92	2.94	—	3.32	2.71	2.81	2.91
Ohio	4.27	3.92	2.96	2.80	2.70	3.18	3.51	2.99
Oklahoma	4.43	3.61	2.93	2.38	2.64	2.70	2.72	2.95
Oregon	2.01	1.42	1.42	1.27	1.24	1.25	—	—
Pennsylvania	4.57	3.31	2.70	1.67	2.63	3.52	2.74	3.38
Rhode Island	3.14	2.34	1.81	1.78	2.32	2.27	2.13	2.10
South Carolina	5.08	4.47	5.32	4.01	4.67	3.94	3.69	4.75
South Dakota	—	—	—	—	—	2.36	—	—
Tennessee	—	—	—	—	—	—	—	—
Texas	3.80	2.82	2.23	2.10	2.45	2.63	2.46	2.35
Utah	—	—	—	1.50	1.67	1.57	2.39	—
Vermont	4.42	3.37	2.68	2.70	3.15	3.45	3.17	—
Virginia	3.42	2.04	3.77	2.93	2.83	3.36	3.14	3.61
Washington	4.75	5.03	4.35	4.01	4.98	6.14	5.52	4.05
West Virginia	2.94	2.87	3.69	—	3.28	3.35	3.31	2.82
Wisconsin	4.29	3.48	2.55	2.38	2.87	2.97	2.56	2.71
Wyoming	26.41	17.57	17.64	3.19	7.72	3.19	6.99	3.44
Total	3.98	3.05	2.37	2.24	2.57	2.69	2.59	2.52

See footnotes at end of table.

Table 23. Average Price of Natural Gas Delivered to Electric Utility[a] Consumers, by State, 1996-1997

(Dollars per Thousand Cubic Feet) — Continued

State	1996				1995			
	April	March	February	January	Total	December	November	October
Alabama	3.10	3.29	2.82	3.71	2.01	2.68	2.19	2.02
Alaska	1.16	1.30	1.29	1.32	1.29	1.24	1.30	1.28
Arizona	2.30	2.31	3.19	2.71	1.77	2.35	1.94	1.84
Arkansas	2.54	2.71	7.11	2.02	1.74	2.68	1.80	1.83
California	2.49	2.83	3.16	2.68	2.28	2.57	2.32	2.37
Colorado	2.06	1.79	1.83	1.80	1.74	1.90	1.73	1.82
Connecticut	2.79	—	—	—	2.01	—	2.10	1.85
Delaware	4.14	2.89	4.63	4.63	2.34	3.70	2.64	2.13
District of Columbia	—	—	—	—	—	—	—	—
Florida	3.18	3.50	2.83	3.87	2.26	3.07	2.43	2.29
Georgia	5.05	5.18	4.90	7.30	2.79	4.55	3.67	3.14
Hawaii	—	—	—	—	—	—	—	—
Idaho	—	—	—	—	—	—	—	—
Illinois	3.03	3.12	3.24	3.19	1.71	2.48	2.04	1.78
Indiana	3.40	3.85	3.98	3.39	2.49	3.01	2.72	2.78
Iowa	3.82	5.45	3.44	3.36	2.72	2.94	3.02	2.73
Kansas	2.45	2.18	2.46	2.28	1.58	2.06	1.58	1.50
Kentucky	3.40	3.72	3.57	3.96	3.01	3.14	2.57	2.87
Louisiana	2.99	3.25	4.04	3.72	1.88	2.72	2.08	1.93
Maine	—	—	—	—	—	—	—	—
Maryland	3.97	5.72	6.54	6.01	2.24	5.16	2.80	2.51
Massachusetts	3.62	4.17	3.70	6.47	2.06	3.92	2.59	2.02
Michigan	0.71	0.83	0.90	0.65	0.73	0.61	0.71	0.43
Minnesota	2.63	2.43	2.13	2.10	1.77	2.11	2.19	1.60
Mississippi	2.95	3.50	8.16	4.08	1.78	2.76	1.96	1.90
Missouri	2.20	3.37	3.12	3.11	1.69	2.38	2.10	1.88
Montana	8.98	20.05	3.68	1.86	3.84	3.84	1.40	7.42
Nebraska	1.94	2.39	2.19	1.96	1.65	1.91	1.67	1.50
Nevada	2.08	2.14	2.22	1.99	1.71	2.02	1.80	1.82
New Hampshire	—	—	—	—	1.86	—	—	1.93
New Jersey	3.50	3.67	2.85	2.76	2.18	3.12	2.63	2.26
New Mexico	2.17	2.23	2.16	2.07	1.57	1.83	1.74	1.65
New York	3.35	3.72	3.91	4.49	2.13	3.10	2.58	2.03
North Carolina	3.23	—	—	3.07	2.40	—	3.04	2.07
North Dakota	—	—	—	3.58	3.71	3.58	3.59	—
Ohio	3.48	3.74	3.54	3.94	2.34	3.04	2.28	2.66
Oklahoma	3.15	3.35	4.13	3.13	2.34	2.88	2.78	2.95
Oregon	—	—	—	—	1.31	1.53	1.73	1.42
Pennsylvania	2.64	3.61	5.41	4.57	2.04	2.63	2.72	1.90
Rhode Island	2.36	2.37	2.45	2.38	1.90	2.06	1.70	1.76
South Carolina	4.44	4.72	4.35	4.23	1.64	3.70	3.55	1.55
South Dakota	—	—	—	—	1.58	2.39	2.02	—
Tennessee	—	—	—	—	—	—	—	—
Texas	2.48	2.35	2.60	2.48	1.93	2.42	2.09	1.96
Utah	—	—	20.25	—	2.26	—	2.40	1.80
Vermont	2.72	—	—	3.06	1.95	1.96	1.85	2.13
Virginia	1.51	3.09	1.99	2.41	2.67	3.32	2.44	2.58
Washington	4.22	5.51	4.90	4.98	4.60	4.21	3.99	5.97
West Virginia	3.00	2.70	2.75	5.00	3.58	3.09	4.92	2.57
Wisconsin	3.01	4.19	2.88	2.64	2.23	2.65	2.51	2.30
Wyoming	30.24	18.59	23.99	6.80	8.32	16.25	12.28	4.15
Total	2.68	2.74	3.07	2.88	2.02	2.58	2.22	2.09

[a] Includes all steam electric utility generating plants with a combined capacity of 50 megawatts or greater.

— = Not Applicable.

Notes: Data for 1995 are final. All other data are preliminary unless otherwise indicated. Geographic coverage is the 50 States and the District of Columbia. See Appendix A, Explanatory Note 5 for discussion of computations and revision policy.

Sources: Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997

State	YTD 1997		YTD 1996		YTD 1995		1997 May	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	72.4	17.4	81.6	16.8	83.5	25.8	55.5	18.0
Alaska	66.5	98.2	72.9	97.9	86.7	75.6	63.8	99.0
Arizona	86.6	21.3	87.4	25.2	89.9	26.6	86.1	18.1
Arkansas	95.2	12.4	96.0	16.4	96.6	15.1	91.4	11.3
California	54.8	11.6	59.5	12.2	58.5	14.7	49.5	12.9
Colorado	NA	NA	94.4	20.6	95.4	23.6	NA	NA
Connecticut	87.7	70.2	91.2	93.6	84.6	85.2	79.7	65.6
Delaware	100.0	34.3	99.6	46.9	100.0	70.3	100.0	35.2
District of Columbia	65.3	—	82.2	—	81.3	—	53.7	—
Florida	96.6	7.3	96.9	12.1	97.4	17.2	93.5	6.3
Georgia	90.4	16.7	94.9	28.9	94.5	38.4	83.9	12.9
Hawaii	NA	—	100.0	—	100.0	—	100.0	—
Idaho	87.9	2.1	88.3	1.3	87.8	2.4	86.6	2.5
Illinois	56.0	11.1	57.3	13.9	52.0	12.8	47.4	13.8
Indiana	80.9	15.0	93.5	24.9	88.8	16.7	38.3	9.6
Iowa	89.2	7.5	89.9	8.1	90.7	8.5	83.2	5.4
Kansas	70.2	11.6	74.1	21.4	77.7	10.9	59.0	13.8
Kentucky	90.2	17.8	90.8	30.1	90.0	26.2	85.3	15.7
Louisiana	84.7	NA	98.9	13.8	98.1	31.0	98.5	NA
Maine	100.0	94.4	100.0	92.7	100.0	100.0	100.0	91.2
Maryland	NA	NA	89.7	16.5	97.7	18.1	NA	NA
Massachusetts	NA	NA	82.0	31.0	89.3	31.8	67.1	41.7
Michigan	66.8	8.8	71.3	8.7	70.3	11.8	57.7	7.8
Minnesota	98.5	42.5	95.2	38.7	94.4	33.5	97.8	39.3
Mississippi	NA	NA	100.3	40.9	97.6	44.1	NA	NA
Missouri	82.4	22.4	86.4	26.5	86.5	25.1	76.9	24.1
Montana	NA	NA	92.2	4.3	92.5	3.9	90.2	2.1
Nebraska	NA	24.1	80.2	26.8	79.9	18.5	NA	22.8
Nevada	74.9	2.3	78.6	1.9	79.9	2.1	65.7	7.4
New Hampshire	95.9	60.6	99.2	64.9	99.5	64.4	91.6	75.1
New Jersey	71.0	52.4	75.7	51.5	90.8	57.0	57.7	33.9
New Mexico	69.2	10.7	61.1	2.0	60.4	2.8	59.5	10.9
New York	NA	NA	NA	16.0	79.1	15.0	NA	NA
North Carolina	94.3	39.8	94.5	72.0	92.2	48.4	89.3	21.7
North Dakota	92.5	47.6	89.8	25.1	84.1	21.2	88.7	37.7
Ohio	68.3	4.5	74.9	7.0	78.6	9.2	58.0	3.2
Oklahoma	88.6	6.0	90.4	8.3	88.9	21.0	82.0	4.1
Oregon	98.7	18.5	99.0	24.0	98.3	27.9	98.5	16.7
Pennsylvania	65.8	15.7	75.3	19.7	73.7	18.3	54.6	16.0
Rhode Island	87.1	18.7	94.7	13.8	100.0	11.0	80.8	48.5
South Carolina	98.4	82.0	99.7	83.6	96.9	79.4	100.0	87.0
South Dakota	NA	NA	86.3	45.6	89.4	33.9	NA	NA
Tennessee	NA	NA	95.9	39.1	94.1	47.0	86.7	29.6
Texas	NA	17.8	70.5	20.4	69.3	28.3	NA	18.2
Utah	84.9	9.1	83.3	9.6	83.9	11.5	78.9	9.0
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	79.5	13.9	91.1	13.8	86.6	16.7	72.2	6.5
Washington	NA	NA	87.8	29.3	93.6	38.2	81.3	21.6
West Virginia	41.0	12.7	53.8	14.9	54.7	14.1	37.6	4.7
Wisconsin	NA	27.5	95.9	39.5	93.1	50.3	NA	22.1
Wyoming	NA	NA	80.6	0.7	92.3	2.8	NA	NA
Total	68.6	16.4	74.4	19.2	79.7	25.7	59.8	15.5

See footnotes at end of table.

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997 — Continued

State	1997							
	April		March		February		January	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	59.3	17.3	76.2	17.9	79.7	19.5	77.7	14.6
Alaska	65.8	98.8	59.4	98.6	71.1	97.9	69.5	97.1
Arizona	83.8	21.2	86.5	22.8	88.0	24.9	87.4	19.9
Arkansas	93.5	11.4	94.9	12.2	96.6	13.7	96.1	13.6
California	51.6	10.6	54.5	11.0	58.5	11.1	58.0	11.7
Colorado	NA	NA	NA	NA	NA	NA	NA	NA
Connecticut	87.1	68.2	87.0	68.2	90.2	78.8	90.1	76.0
Delaware	100.0	35.5	100.0	34.7	100.0	35.5	100.0	30.8
District of Columbia	100.0	—	59.5	—	62.5	—	67.6	—
Florida	99.8	9.4	97.0	6.7	96.6	8.0	96.1	8.2
Georgia	87.2	15.9	88.9	15.7	92.5	20.2	93.4	19.3
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	86.1	2.1	87.8	2.1	89.7	2.2	87.8	1.9
Illinois	53.2	8.4	54.4	10.3	54.3	9.4	62.0	13.7
Indiana	82.1	10.6	86.5	12.7	93.0	19.8	93.7	20.1
Iowa	90.3	7.2	88.5	7.4	89.4	7.2	90.3	9.6
Kansas	68.7	12.5	60.1	11.4	65.7	13.2	88.8	8.2
Kentucky	88.1	14.7	89.6	15.5	90.8	19.4	92.0	22.0
Louisiana	99.2	8.6	64.5	10.9	97.8	NA	80.1	9.5
Maine	100.0	91.3	100.0	91.8	100.0	100.0	100.0	100.0
Maryland	NA	NA	NA	NA	NA	NA	NA	NA
Massachusetts	72.2	38.5	70.9	34.4	67.3	36.8	NA	NA
Michigan	65.3	10.4	66.4	12.8	69.4	14.2	69.2	14.7
Minnesota	98.0	42.6	99.0	47.3	98.7	45.5	98.6	37.1
Mississippi	92.4	35.2	96.3	36.2	96.0	38.0	96.9	38.4
Missouri	80.7	16.8	83.9	27.3	79.9	19.1	86.3	27.7
Montana	R91.1	R4.5	90.4	4.1	93.0	28.6	90.9	4.4
Nebraska	NA	20.3	70.8	21.8	92.8	27.0	75.6	28.2
Nevada	69.2	8.0	78.1	7.3	79.7	15.2	77.2	8.3
New Hampshire	92.0	62.3	94.0	53.6	99.1	52.1	98.8	44.2
New Jersey	64.0	36.9	67.5	34.5	93.5	36.0	69.0	40.8
New Mexico	58.1	2.8	70.5	3.9	72.6	2.1	74.1	19.4
New York	NA	NA	NA	NA	NA	NA	NA	NA
North Carolina	87.5	22.4	91.6	30.2	95.9	39.6	100.0	90.1
North Dakota	91.8	39.4	91.4	59.4	93.9	49.5	93.4	43.3
Ohio	64.8	3.3	69.2	5.5	68.5	5.6	72.9	4.7
Oklahoma	86.3	3.8	88.1	5.9	90.5	8.7	90.7	7.4
Oregon	98.5	19.3	98.8	19.6	98.9	20.2	98.8	17.0
Pennsylvania	64.2	13.4	64.3	15.4	69.8	14.9	69.3	18.9
Rhode Island	88.5	55.8	82.2	61.7	91.7	45.9	89.6	38.1
South Carolina	95.8	77.7	97.4	80.3	98.2	78.2	100.0	86.8
South Dakota	85.7	22.6	86.3	26.7	85.7	30.4	86.9	31.4
Tennessee	90.4	29.5	NA	NA	92.5	28.7	94.0	35.9
Texas	59.2	19.3	NA	18.0	67.7	16.0	NA	17.9
Utah	83.8	9.2	83.0	6.7	87.2	10.7	86.2	10.2
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	72.6	12.2	77.1	13.2	81.9	6.8	87.5	15.5
Washington	R85.3	R29.2	86.0	27.3	—	27.4	87.8	26.7
West Virginia	13.0	27.3	59.5	19.8	R67.1	13.9	67.0	14.4
Wisconsin	91.4	21.6	95.1	28.4	93.4	31.0	94.1	31.9
Wyoming	NA	NA	54.7	NA	74.0	NA	76.1	NA
Total	R65.1	15.8	68.6	16.4	71.2	16.2	72.0	17.8

See footnotes at end of table.

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997 — Continued

State	1996							
	Total		December		November		October	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	64.9	13.5	76.7	14.6	68.7	14.4	66.4	12.6
Alaska	70.3	96.2	70.6	97.3	67.3	97.7	63.7	97.8
Arizona	83.7	20.6	84.0	22.6	84.1	20.7	83.2	19.1
Arkansas	94.2	16.4	95.7	16.8	94.0	15.2	90.2	14.5
California	53.9	10.7	55.7	9.4	57.5	10.4	43.7	9.1
Colorado	87.7	21.0	95.2	20.5	93.9	23.3	91.0	27.9
Connecticut	87.1	84.0	88.1	81.8	84.2	76.9	81.5	74.1
Delaware	100.0	37.7	100.0	34.5	100.0	34.6	100.0	30.7
District of Columbia	71.8	—	66.1	—	56.0	—	48.8	—
Florida	79.1	8.9	96.3	9.2	97.1	8.0	97.5	8.8
Georgia	84.9	20.8	92.4	23.5	91.4	19.4	89.6	21.3
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	86.6	1.4	87.6	2.5	84.9	0.5	77.3	1.6
Illinois	53.2	11.4	55.8	19.0	52.7	11.5	48.5	7.3
Indiana	85.6	15.9	93.8	22.0	89.5	15.4	87.9	12.9
Iowa	85.6	8.9	86.8	11.7	86.1	18.3	81.0	9.8
Kansas	58.0	11.8	67.8	9.8	79.8	8.2	69.3	11.4
Kentucky	82.2	20.9	90.7	19.7	87.3	17.9	87.5	17.4
Louisiana	91.1	9.1	97.9	10.9	98.1	9.4	98.6	9.5
Maine	100.0	91.0	100.0	90.2	100.0	91.5	100.0	91.3
Maryland	83.9	11.1	84.1	19.1	88.7	2.0	72.7	3.5
Massachusetts	72.2	24.4	68.7	29.5	62.1	40.2	69.5	34.8
Michigan	60.6	5.9	68.6	12.2	65.5	9.1	54.0	5.2
Minnesota	91.8	36.8	97.3	42.5	97.2	41.2	98.1	35.7
Mississippi	84.7	[R]34.5	96.5	38.1	91.3	38.9	95.3	[R]34.3
Missouri	80.3	23.0	84.4	32.5	78.4	27.4	69.0	16.8
Montana	90.3	3.6	89.5	4.6	87.7	4.7	87.1	2.9
Nebraska	68.5	24.6	76.3	27.9	68.3	28.0	39.4	19.2
Nevada	74.9	1.6	75.3	8.0	71.5	7.6	64.9	5.4
New Hampshire	99.0	58.6	98.5	50.3	98.9	63.8	98.6	55.9
New Jersey	72.6	49.1	70.5	20.3	69.7	34.1	67.5	30.1
New Mexico	56.4	3.6	69.8	15.1	66.4	5.5	61.3	2.7
New York	NA	[R]9.7	NA	13.6	NA	10.6	NA	10.7
North Carolina	92.0	49.4	99.0	90.4	91.9	43.0	85.4	24.3
North Dakota	86.3	28.3	88.6	40.6	88.7	46.9	77.2	33.3
Ohio	69.5	5.2	74.0	4.2	72.4	10.5	68.4	2.8
Oklahoma	83.5	6.9	89.8	7.4	85.2	7.9	78.2	5.2
Oregon	98.3	18.0	98.6	16.0	98.3	14.4	97.0	14.2
Pennsylvania	69.3	15.6	63.4	20.3	66.3	16.7	63.5	13.1
Rhode Island	91.6	16.4	89.4	45.8	87.6	55.7	67.0	57.2
South Carolina	81.4	64.7	100.0	86.5	96.8	82.2	95.6	79.3
South Dakota	82.7	34.6	82.8	33.3	80.7	34.1	72.9	15.8
Tennessee	77.4	28.2	92.4	32.2	91.6	30.9	83.5	33.8
Texas	NA	18.6	72.7	17.6	61.7	17.2	NA	20.6
Utah	81.9	9.2	84.4	10.0	81.2	9.6	79.5	9.7
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	73.0	[R]13.3	85.9	14.9	83.0	14.4	72.5	7.0
Washington	85.9	23.8	87.4	26.5	84.6	21.6	82.7	19.3
West Virginia	45.2	13.4	69.2	13.9	52.0	14.4	41.0	13.0
Wisconsin	75.1	30.9	93.7	30.5	93.0	30.6	96.3	28.4
Wyoming	52.4	0.6	42.4	0.7	58.8	0.2	44.2	0.2
Total	70.4	17.4	71.0	17.9	68.8	16.6	62.0	15.8

See footnotes at end of table.

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997 — Continued

State	1996							
	September		August		July		June	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	68.5	12.8	67.8	12.4	69.2	13.3	71.0	13.6
Alaska	60.8	100.0	64.1	91.0	61.8	88.7	65.2	93.7
Arizona	83.5	19.1	78.4	20.5	82.1	19.6	83.6	21.1
Arkansas	88.9	21.3	91.5	16.3	88.5	18.3	94.2	19.1
California	44.9	9.6	44.3	8.8	48.0	11.5	53.0	10.4
Colorado	92.0	25.7	89.0	21.9	89.8	25.3	93.6	20.4
Connecticut	69.2	73.5	77.8	73.0	81.3	82.0	79.2	90.3
Delaware	100.0	27.5	100.0	26.1	100.0	26.2	100.0	38.2
District of Columbia	47.8	—	53.0	—	62.6	—	71.2	—
Florida	97.7	7.2	97.3	8.0	97.6	8.2	97.7	9.1
Georgia	85.4	26.7	87.0	21.2	87.6	13.5	87.8	17.4
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	80.0	1.3	82.0	1.7	82.4	1.1	86.0	1.7
Illinois	42.8	5.5	42.7	5.0	39.3	4.9	43.8	4.4
Indiana	70.7	8.1	74.3	9.1	79.1	8.6	78.0	4.9
Iowa	76.3	5.6	91.9	8.2	76.5	4.8	87.6	5.4
Kansas	69.3	10.2	34.1	10.3	43.3	10.0	53.5	12.1
Kentucky	81.8	15.4	82.9	15.2	83.2	21.4	88.6	13.8
Louisiana	98.8	9.0	97.4	10.5	99.1	10.2	96.7	10.5
Maine	100.0	89.1	100.0	88.0	100.0	88.7	100.0	89.8
Maryland	72.2	1.6	68.7	3.5	62.9	6.0	72.0	8.1
Massachusetts	55.0	30.2	61.1	34.8	68.0	36.8	70.6	39.4
Michigan	42.7	3.1	39.5	3.4	42.3	3.3	44.2	4.6
Minnesota	93.8	34.4	93.3	37.6	94.4	38.3	95.6	33.8
Mississippi	96.7	34.4	97.5	35.9	96.9	33.0	96.3	34.9
Missouri	67.0	17.8	57.7	13.0	61.7	19.4	72.0	23.4
Montana	85.6	2.2	86.9	1.5	87.4	1.8	90.5	1.8
Nebraska	64.4	22.0	52.9	21.7	50.8	21.7	64.5	18.0
Nevada	68.4	5.5	67.6	5.8	71.1	6.0	73.7	6.8
New Hampshire	98.2	55.9	98.2	53.6	98.0	54.9	98.5	58.3
New Jersey	60.3	34.4	60.3	38.8	61.3	38.4	64.4	30.7
New Mexico	59.4	1.6	61.1	4.4	64.2	2.2	64.1	4.4
New York	NA	11.1	NA	11.0	NA	11.1	NA	12.4
North Carolina	85.9	21.4	88.3	30.6	95.9	61.4	90.5	44.7
North Dakota	72.4	21.7	73.1	9.2	72.2	8.5	62.2	12.5
Ohio	65.0	3.1	53.8	2.7	56.3	2.1	42.0	2.8
Oklahoma	78.3	5.2	74.5	5.9	76.4	5.3	78.7	5.2
Oregon	97.5	14.0	98.0	13.6	98.1	13.6	98.3	16.3
Pennsylvania	66.3	13.7	49.0	14.4	63.8	15.8	63.6	14.4
Rhode Island	50.5	51.4	87.1	50.4	84.4	42.2	92.1	57.0
South Carolina	96.6	80.6	96.6	80.7	100.0	87.2	[R]96.3	77.3
South Dakota	68.6	12.3	66.9	13.5	67.1	15.1	74.5	11.9
Tennessee	75.9	23.6	83.6	30.4	91.1	39.5	86.9	35.0
Texas	50.3	16.7	NA	17.2	65.0	24.7	60.4	20.8
Utah	78.4	8.6	71.9	7.7	73.3	7.4	72.9	9.5
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	62.4	7.7	72.2	6.6	65.8	7.2	63.9	9.6
Washington	81.5	19.9	80.1	11.7	80.0	21.1	82.0	21.8
West Virginia	32.5	11.6	41.9	12.5	41.5	12.8	25.2	12.2
Wisconsin	96.8	24.9	97.5	25.0	85.7	25.9	92.9	26.2
Wyoming	96.1	0.9	95.1	0.9	98.8	0.7	89.4	0.8
Total	58.9	14.6	58.7	14.8	60.6	17.2	62.4	15.6

See footnotes at end of table.

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997 — Continued

State	1996							
	May		April		March		February	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	76.4	15.0	80.5	16.6	80.8	17.3	85.6	18.5
Alaska	68.9	98.5	71.9	98.5	76.3	97.7	79.1	98.4
Arizona	84.8	29.2	83.7	22.5	86.9	24.2	90.2	27.0
Arkansas	92.4	18.8	96.3	17.9	95.6	15.0	96.9	16.5
California	52.2	11.6	63.7	12.4	63.3	12.5	58.7	15.3
Colorado	93.6	18.5	94.2	17.9	94.8	16.8	96.2	17.6
Connecticut	78.6	92.4	89.9	94.5	93.1	96.6	93.2	98.2
Delaware	100.0	31.7	100.0	28.5	100.0	56.9	100.0	57.6
District of Columbia	71.1	—	87.8	—	84.6	—	83.8	—
Florida	97.8	10.8	97.7	11.6	96.9	11.5	97.1	11.7
Georgia	91.4	23.5	94.3	26.8	96.5	30.4	97.9	33.0
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	85.7	1.3	87.2	1.3	88.2	1.4	90.1	1.3
Illinois	49.3	7.9	53.4	12.4	59.3	16.5	59.3	16.3
Indiana	86.8	40.5	94.4	19.6	95.4	24.0	96.8	25.6
Iowa	90.4	5.6	89.4	7.3	88.2	8.2	91.6	8.1
Kansas	50.6	17.9	64.7	15.8	73.9	14.4	83.7	14.7
Kentucky	81.6	19.4	88.8	27.9	91.2	32.3	90.8	32.9
Louisiana	94.4	9.6	98.9	10.0	97.6	9.4	98.4	10.1
Maine	100.0	90.1	100.0	86.5	100.0	87.1	100.0	100.0
Maryland	70.8	10.7	82.5	17.5	91.1	21.8	96.9	19.0
Massachusetts	78.7	38.2	80.0	43.3	82.2	37.3	83.2	41.0
Michigan	62.6	7.1	66.8	11.1	71.6	11.7	70.6	13.7
Minnesota	97.2	32.4	97.0	50.0	96.9	41.6	97.6	37.6
Mississippi	97.0	35.1	96.9	36.9	96.6	38.2	97.8	38.8
Missouri	78.5	24.6	84.4	25.8	85.4	23.9	89.7	32.9
Montana	90.5	2.8	92.4	4.0	91.6	5.0	93.5	5.6
Nebraska	71.5	23.4	74.7	24.3	82.0	25.9	82.3	29.5
Nevada	75.1	6.7	77.3	8.5	78.9	8.7	81.1	10.0
New Hampshire	98.9	66.9	99.1	60.6	99.2	57.4	99.3	61.1
New Jersey	67.6	39.9	72.2	34.8	77.3	41.8	79.1	35.1
New Mexico	45.8	4.0	56.4	2.4	57.9	0.7	60.2	0.5
New York	NA	13.2	NA	14.5	NA	R20.0	NA	18.4
North Carolina	91.2	35.9	99.7	77.1	99.9	88.4	99.8	66.9
North Dakota	88.4	20.1	84.6	27.0	90.5	21.9	92.9	25.0
Ohio	63.1	4.3	72.2	5.9	76.0	7.2	76.0	9.8
Oklahoma	82.8	3.7	93.0	8.2	91.4	9.0	93.2	11.1
Oregon	98.1	18.1	98.1	23.7	98.6	25.5	98.8	26.6
Pennsylvania	68.2	15.9	72.2	18.5	76.5	25.5	77.8	23.6
Rhode Island	97.9	62.0	97.8	59.4	98.5	90.7	99.3	84.1
South Carolina	R96.9	78.0	100.0	86.4	100.0	83.6	100.0	81.4
South Dakota	78.7	18.3	85.0	25.0	84.7	71.4	87.9	42.8
Tennessee	89.1	32.8	94.9	43.8	91.6	44.5	96.8	38.2
Texas	61.7	20.5	66.6	19.5	63.1	17.7	75.9	23.7
Utah	77.7	9.0	82.3	10.2	82.8	9.4	85.6	10.0
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	78.0	15.4	83.7	14.6	90.8	13.0	96.5	13.8
Washington	84.5	23.2	84.4	26.0	87.6	31.3	89.8	31.2
West Virginia	42.9	12.6	51.4	12.8	60.7	14.7	62.3	16.6
Wisconsin	93.3	31.0	93.7	35.6	95.6	46.1	96.1	42.8
Wyoming	58.5	0.8	60.2	0.7	94.2	0.7	94.1	0.6
Total	66.8	17.3	72.2	18.7	74.6	19.3	76.9	20.6

See footnotes at end of table.

Table 24. Percentage of Total Deliveries Represented by Onsystem Sales, by State, 1995-1997 — Continued

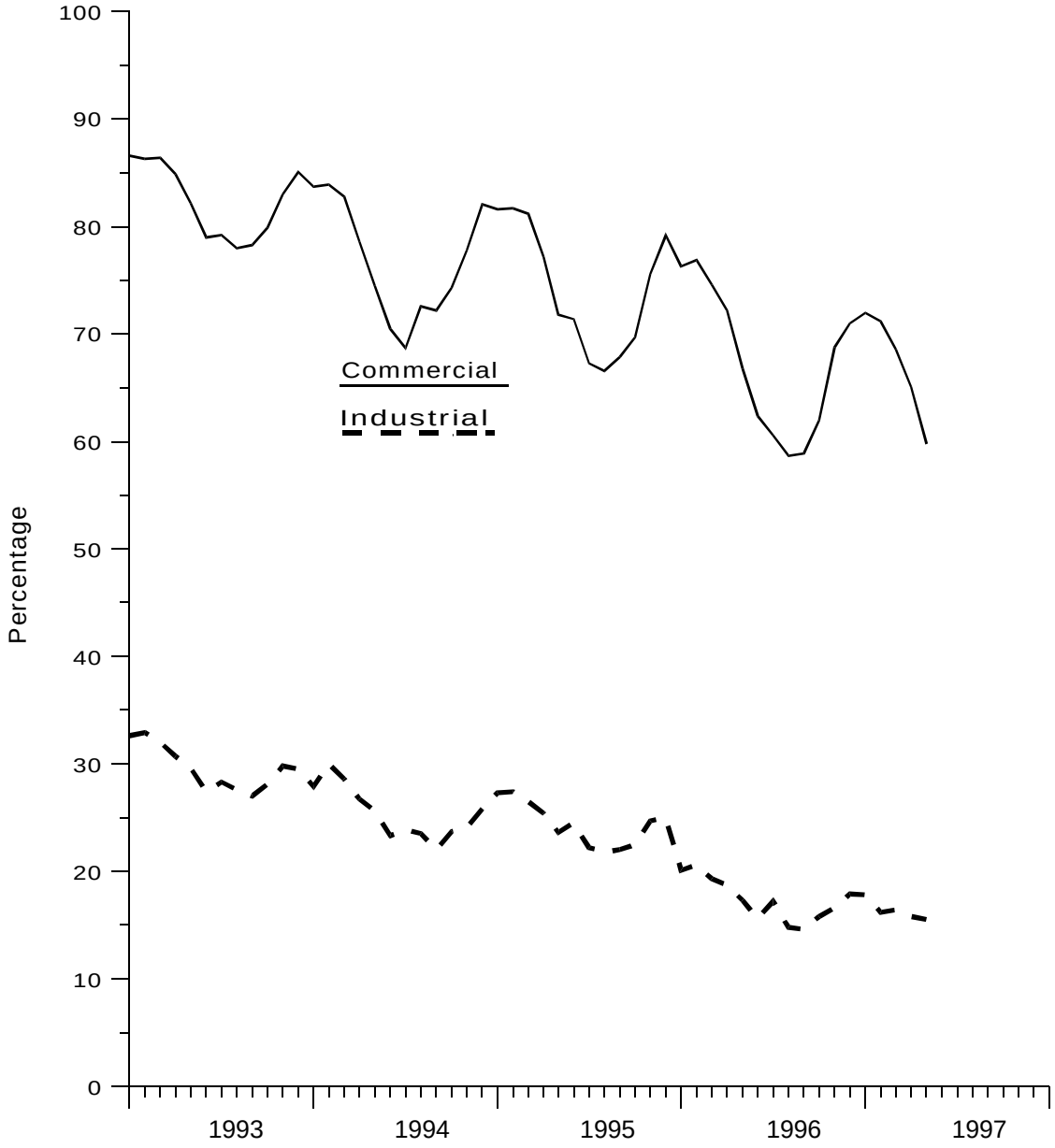
State	1996		1995					
	January		Total		December		November	
	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial	Commercial	Industrial
Alabama	81.5	17.7	80.1	23.4	81.1	25.8	72.8	21.6
Alaska	73.7	96.3	79.9	52.1	77.9	60.6	72.9	64.3
Arizona	89.5	24.4	88.4	24.7	87.2	25.1	87.9	21.3
Arkansas	96.4	15.6	96.0	14.2	100.0	9.7	92.6	15.5
California	59.5	13.9	52.1	13.2	50.9	11.2	48.7	11.1
Colorado	95.3	24.9	94.2	8.5	93.8	9.0	93.5	11.3
Connecticut	93.4	95.1	82.0	90.1	91.7	96.1	87.7	99.5
Delaware	100.0	58.3	100.0	67.6	100.0	57.4	100.0	66.6
District of Columbia	80.5	—	76.8	—	77.4	—	74.6	—
Florida	98.8	15.4	97.6	16.2	96.7	17.7	97.4	18.0
Georgia	97.4	34.0	93.5	35.7	97.2	46.2	94.8	37.8
Hawaii	100.0	—	100.0	—	100.0	—	100.0	—
Idaho	88.8	1.1	86.0	2.2	85.5	1.1	85.9	1.3
Illinois	58.0	15.2	50.4	11.0	53.3	14.5	51.8	13.3
Indiana	95.7	24.5	87.8	14.2	93.4	18.2	90.7	16.8
Iowa	90.2	10.9	89.3	8.2	91.2	9.9	89.6	12.0
Kansas	79.6	25.7	73.6	12.9	70.7	15.6	88.7	14.9
Kentucky	92.7	32.6	89.2	27.7	92.7	34.6	91.0	30.6
Louisiana	99.7	12.2	98.1	31.0	97.6	30.7	97.3	32.6
Maine	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Maryland	94.7	20.7	96.9	13.3	97.0	12.0	95.6	6.5
Massachusetts	83.9	44.0	84.9	53.4	79.5	48.1	81.6	53.7
Michigan	72.2	13.7	66.4	12.2	72.5	16.2	68.0	12.1
Minnesota	95.9	38.0	93.7	34.6	94.6	36.3	90.4	40.2
Mississippi	97.9	47.8	97.0	42.4	95.5	40.3	95.6	41.9
Missouri	87.4	26.1	83.3	22.4	85.7	24.3	78.7	20.1
Montana	92.0	4.5	91.6	3.1	91.9	4.6	91.8	3.4
Nebraska	83.7	31.2	77.1	16.5	NA	25.7	NA	17.2
Nevada	79.7	10.0	76.5	7.7	75.2	8.1	70.8	7.5
New Hampshire	99.3	64.0	99.2	64.4	99.1	64.6	98.9	69.8
New Jersey	79.9	36.8	86.3	52.9	82.9	55.0	81.9	49.7
New Mexico	70.2	2.8	60.3	6.6	64.4	14.2	62.3	16.2
New York	NA	18.3	76.2	17.4	79.9	22.2	77.2	20.4
North Carolina	99.9	93.4	92.4	46.9	99.9	94.2	93.6	51.4
North Dakota	90.4	31.7	80.9	18.2	86.5	26.4	80.3	21.8
Ohio	77.3	8.3	76.3	7.4	79.2	8.8	77.9	7.1
Oklahoma	91.5	8.7	85.2	15.2	86.0	9.5	79.8	7.6
Oregon	98.4	26.5	98.1	25.5	98.4	25.2	97.9	24.3
Pennsylvania	76.4	15.5	68.4	16.3	70.6	23.0	48.3	14.0
Rhode Island	100.0	39.4	100.0	11.1	100.0	4.9	100.0	13.7
South Carolina	100.0	81.9	96.4	81.4	100.0	90.0	95.9	78.5
South Dakota	89.9	31.0	86.9	27.6	88.5	31.4	85.8	35.0
Tennessee	96.7	39.8	93.8	47.6	97.2	56.2	96.5	61.0
Texas	71.4	21.5	68.6	25.5	67.9	22.7	70.7	24.9
Utah	84.0	9.4	81.8	11.0	82.8	8.9	80.2	10.4
Vermont	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Virginia	96.9	14.8	84.1	14.8	91.4	17.0	84.4	19.1
Washington	89.1	33.0	91.8	32.9	89.7	29.2	88.7	28.1
West Virginia	60.3	19.2	51.6	14.4	60.8	16.3	51.6	16.0
Wisconsin	95.4	40.8	92.0	46.6	93.6	42.9	93.4	43.7
Wyoming	93.3	0.7	93.6	2.8	NA	NA	NA	NA
Total	76.3	20.1	76.7	24.5	79.2	25.0	75.6	24.7

R = Revised Data.
NA = Not Available.
— = Not Applicable.

Notes: Volumes of natural gas reported for the commercial and industrial sectors in this publication include data for both sales and deliveries for the account of others. This table shows the percent of the total State volume that represents natural gas sales to the commercial and industrial sectors. This information may be helpful in evaluating commercial and industrial price data which are based on sales data only. See Appendix C, Statistical Considerations, for a discussion of the computation of natural gas prices.

Source: Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Figure 6. Percentage of Total Deliveries Represented by Onsystem Sales, 1993-1997



Sources: Energy Information Administration, Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers" and Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition."

Appendix A

Explanatory Notes

The Energy Information Administration (EIA) publishes monthly data for the supply and disposition of natural gas in the United States in the *Natural Gas Monthly* (NGM). The information in this Appendix is provided to assist users in evaluating the monthly data. There is a brief description of what data are estimated and what data are taken from submitted reports, followed by ten technical notes that provide important information for individual data series.

The monthly data are preliminary when initially published. Data shown in this report for the most current months are taken from the EIA Short-Term Integrated Forecasting System (STIFS) model computations. Each month, EIA staff review the STIFS model estimates and adjust them, if necessary, based on their knowledge of new developments in the natural gas industry. Data for prior months are estimated or taken from submitted reports.

For data that are not taken from STIFS computations, Table A1 below lists the methodologies for deriving the monthly data to be published.

Table A1. Methodology for Reporting Initial Monthly Natural Gas Supply and Disposition Data

Components	Reporting Methodology
Supply and Disposition	
Marketed Production	Reported on Form EIA-895 and Estimated from Historical Data
Extraction Loss	Derived from Marketed Production
Dry Production	Marketed Production minus Extraction Loss
Withdrawals from Storage	Reported on Form EIA-191
Supplemental Gaseous Fuels	Derived from Supply Estimates and Coal Gasification Information
Imports	Estimated from National Energy Board of Canada Information and Liquefied Natural Gas Information
Additions to Storage	Reported on Form EIA-191
Exports	Estimated from Industry Trends and Liquefied Natural Gas Information
Current-Month Consumption	Estimated from Historical Month-to-Month Percent Changes
Consumption by Sector	
Lease and Plant Fuel	Derived from Marketed Production
Pipeline Fuel	Derived from Estimates for Lease and Plant Fuel and Deliveries to Consumers
Residential	Estimated from Reports to the Sample Survey Form EIA-857
Commercial	Estimated from Reports to the Sample Survey Form EIA-857
Industrial	Estimated from Reports to the Sample Survey Form EIA-857
Electric Utilities	Reported on Form EIA-759

The STIFS model contains a series of calculations that produce forecasts for all of the energy industry. It is driven primarily by three sets of inputs or assumptions: estimates of key macroeconomic variables, world oil price assumptions, and assumptions about the severity of weather. The natural gas estimates also reflect other key inputs or assumptions including gas wellhead prices, electric power generation by other energy sources, and U.S. gas import capacity. The macroeconomic variable estimates are produced by DRI/McGraw-Hill but are adjusted by EIA to reflect EIA assumptions about the world price of oil, energy product prices, and other assumptions which may affect the macroeconomic outlook. The EIA publishes forecasts for the energy industry each quarter in the *Short-Term Energy Outlook.*

For production, total supply and disposition, and storage data (Tables l, 2, and 9), the most current two months shown are estimates produced from STIFS computations, and data that are two months or more prior to the date of publication are estimated or taken from submitted reports. For example, in the March issue of the NGM, February and March data are taken from the STIFS model computations while January and prior months data are estimated from available data sources or reported directly on EIA forms. For consumption data by sector (Table 3), the most current three months shown are estimates produced from STIFS computations while data that are three months prior to date of publication are taken from EIA forms.

Note 1. Nonhydrocarbon Gases Removed

Annual Data

Data on nonhydrocarbon gases removed from marketed production—carbon dioxide, helium, hydrogen sulfide, and nitrogen—are reported by State agencies on the voluntary Form EIA-895. For 1995, of the 33 producing States, 22 reported data on nonhydrocarbon gases removed. The 22 States accounted for 60 percent of total 1995 gross withdrawals. Of the 22 States reporting nonhydrocarbon gases removed, 11 reported zero values: Alaska, Arizona, Arkansas, Colorado, Illinois, Maryland, Missouri, Nevada, New York, South Dakota, and Virginia. The ten States reporting volumes greater than zero are Alabama, California, Florida, Kentucky, Mississippi, Nebraska, New Mexico, North Dakota, Texas, and Wyoming. In addition, Kansas, Louisiana, Montana, and Oklahoma, which together accounted for 40 percent of gross withdrawals, did not report nonhydrocarbon gases removed separately. However, their gross withdrawal data excluded all or most of the nonhydrocarbon gases removed on leases. No estimates are made for States not reporting nonhydrocarbon gases removed.

Preliminary Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual* for the year in which the report month falls. Seven States report monthly data on nonhydrocarbon gases removed: Alabama, Arizona, Mississippi, New Mexico, North Dakota, Oregon and Texas. Monthly data for California, Colorado, Florida, and Wyoming are estimated based on annual data reported on Form EIA-895. Nonhydrocarbon gases as an annual percentage of gross withdrawals reported by each of the six States is applied to each State's monthly gross withdrawal data to produce an estimate of nonhydrocarbon gases removed.

Final Monthly Data

Beginning with report year 1990, States filing the Form EIA-627, "Annual Quantity and Value of Natural Gas Report," were asked to supply monthly breakdowns of all data previously reported on an annual basis. The sums of the reported figures were used to calculate monthly volumes. In 1997 the Form EIA-627 was discontinued. States were requested to file an annual schedule on the monthly Form EIA-895, "Monthly Quantity and Value of Natural Gas Report."

For States not supplying monthly data on the annual schedule of the EIA-895, final monthly data are calculated by proportionally allocating the differences between total annual data reported on the Form EIA-895 and the sum of monthly data (January-December).

Note 2. Supplemental Gaseous Fuels

Annual Data

Annual data are published from Form EIA-176.

Preliminary Monthly Data

All monthly data are considered preliminary until after the publication of the *Natural Gas Annual* for the year in which the report month falls. Monthly estimates are based on the annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the monthly sum of these three elements to compute a monthly supplemental gaseous fuels figure.

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual.* Final monthly data are estimated based on the revised annual ratio of supplemental gaseous fuels to the sum of dry gas production, net imports, and net withdrawals from storage. This ratio is applied to the revised monthly sum of these three elements to compute final monthly data.

Note 3. Production

Annual Data

Natural gas production data are collected from 33 gas-producing States on Form EIA-895 which includes gross withdrawals, vented and flared, repressuring, nonhydrocarbon gases removed, fuel used on leases, marketed production (wet), and extraction loss. The U.S. Minerals Management Service (MMS) also supplies data on the quantity and value of natural gas production on the Gulf of Mexico and Outer Continental Shelf. No adjustments are made to the data.

Estimated Monthly Data

State marketed production data for a particular month are estimated if data are unavailable at the time of publication. The data are estimated based on final monthly data reported on the Form EIA-895 for the previous year.

Estimates for total U.S. marketed production are based on final monthly data reported on the Form EIA-895 for the previous year. State estimates for nonhydrocarbon gas removed, gas used for repressuring, and gas vented and flared are based on the ratio of the item to gross withdrawals as reported on the EIA-895. These ratios are applied to the month's estimates for gross withdrawals to calculate figures for nonhydrocarbon gases removed, gas used for repressuring, and gas vented and flared. Estimates for gross withdrawal data are calculated from final monthly data filed on Form EIA-895 for the previous year.

Preliminary Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual* for the year in which the report month falls. Preliminary monthly data are published from reports from the Form EIA-895 and the MMS. Volumetric data are converted, as necessary, to a standard 14.73 psia pressure base. Data are revised as Table 7 monthly data are updated.

Final Monthly Data

Final monthly data for 1993, 1994, and 1995 are the sums of monthly data reported on the annual Form EIA-627, "Annual Quantity and Value of Natural Gas Report." For prior years, the differences between each State's annual production data reported on the EIA-627 and the sum of its monthly IOGCC reports for the year were allocated proportionally to the monthly IOGCC data.

Note 4. Imports and Exports

Annual Data and Final Monthly Data

Annual and final monthly data are published from the Office of Fossil Enery, U.S. Department of Energy, *Natural Gas Imports and Exports,* which requires data to be reported each quarter by month for the calendar year.

Preliminary Monthly Data - Imports

Preliminary monthly import data are based on data from the National Energy Board of Canada and responses to informal industry contacts and EIA estimates. Preliminary data are revised after the publication of the article "U.S. Imports and Exports of Natural Gas" for the calendar year.

Preliminary Monthly Data - Exports

Preliminary monthly export data are based on historical data from the Office of Fossil Energy, U.S. Department of Energy, *Natural Gas Imports and Exports*, informal industry contacts, and information gathered from natural gas industry trade publications. Preliminary monthly data are revised after publication of "U.S. Imports and Exports of Natural Gas" for the calendar year in which the report month falls.

Note 5. Consumption

All Annual Data

All consumption data except electric utility data are from the Form EIA-857 and Form EIA-176. No adjustments are made to the data. Electric utility data are reported on Form EIA-759.

Monthly Data

All monthly data are considered preliminary until after publication of the *Natural Gas Annual.*

Total Consumption

Preliminary Monthly Data

The most current month estimate is calculated based on the arithmetic average change from the previous month for the previous 3 years. The following month this estimate is revised by summing the components (pipeline fuel, lease and plant fuel, and deliveries to consumers).

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual*. Final monthly total consumption is obtained by summing its components.

Residential, Commercial, and Industrial Sector Consumption

Preliminary Monthly Data

Preliminary monthly residential, commercial, and industrial data are from Form EIA-857. See Appendix C, "Statistical Considerations," for a detailed explanation off sample selection and estimation procedures.

Average Price of Deliveries to Consumers

Price data are representative of prices for gas sold and delivered to residential, commercial, and industrial consumers. These prices do not reflect average prices of natural gas transported to consumers for the account of third parties or "spot-market" prices.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual*. Final monthly data are estimated by allocating annual consumption data from the Form EIA-176 to each month in proportion to monthly volumes reported in Form EIA-857.

Electric Utility Sector Consumption

All Monthly Data

Monthly data published are from Form EIA-759.

Pipeline Fuel Consumption

Preliminary Monthly Data

Preliminary data are estimated based on the pipeline fuel consumption as an annual percentage of total consumption from the previous year's Form EIA-176. This percentage is applied to each month's total consumption figure to compute the monthly estimate.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual.* Final monthly data are based on the revised annual ratio of pipeline fuel consumption to total consumption from the Form EIA-176. This ratio is applied to each month's revised total consumption figure to compute final monthly pipeline fuel consumption estimates.

Lease and Plant Fuel Consumption

Preliminary Monthly Data

Preliminary monthly data are estimated based on lease and plant fuel consumption as an annual percentage of marketed production. This percentage is applied to each month's marketed production figure to compute estimated lease and plant fuel consumption.

Final Monthly Data

Monthly data are revised after publication of the *Natural Gas Annual*. Final monthly plant fuel data are based on a revised annual ratio of lease and plant fuel consumption to marketed production from Form EIA-176. This ratio is applied to each month's revised marketed production figure to compute final monthly plant fuel consumption estimates. Final monthly lease data are collected on the Form EIA-627 and estimates from the Form EIA-176. See the *Natural Gas Annual* for a complete discussion of this process.

Note 6. Extraction Loss

Annual Data

Extraction loss data are calculated from filings of Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production." For a fuller discussion, see the *Natural Gas Annual.*

Preliminary Monthly Data

Preliminary data are estimated based on extraction loss as an annual percentage of marketed production. This percentage is applied to each month's marketed production to estimate monthly extraction loss.

Final Monthly Data

Monthly data are revised after the publication of the *Natural Gas Annual.* Final monthly data are estimated by allocating annual extraction loss data to each month based on its total natural gas marketed production.

Note 7. Natural Gas Storage

Underground Natural Gas Storage

All monthly data concerning underground storage are published from the EIA-191. A new EIA-191 became effective in January 1994. Injection and withdrawal data from the EIA-191 survey are adjusted to correspond to data from Form EIA-176 following publication of the *Natural Gas Annual.*

Underground and Liquefied Natural Gas Storage

The final monthly and annual storage and withdrawal data for 1991 through 1995 shown in Table 2 include both underground and liquefied natural gas (LNG) storage. Underground storage data are obtained from the EIA-191 and EIA-176 surveys in the manner described earlier. Annual data on LNG additions and withdrawals are taken from Form EIA-176. Monthly data are estimated by computing the ratio of each month's underground storage additions and withdrawals to annual underground storage additions and withdrawals and applying it to annual LNG data.

Note 8. Average Wellhead Value

Annual Data

Form EIA-895 requests State agencies to report the quantity and value of marketed production. When complete data are unavailable, the form instructs the State agency to report the available value and the quantity of marketed production associated with this value. A number of States reported volumes of production and associated values for other than marketed production. In addition, information for several States which were unable to provide data was obtained from Form EIA-176. It should be noted that Form EIA-176 reports a fraction of State production. The imputed value of marketed production in each State is calculated by dividing the State's reported value by its associated production. This unit price is then applied to the quantity of the State's marketed production to derive the imputed value of marketed production.

Preliminary Monthly Data

A preliminary estimate of the U.S. gas price is made each month based on the change in the production-weighted gas price from five States: Kansas, Mississippi, New Mexico, Oklahoma, and Texas. Gas prices for these five States are used because both their gas production and value represent a substantial sample of the U.S. gas production and value (roughly 50 percent), and their prices are readily available and provide a consistent series. The latest preliminary U.S. gas price estimate is calculated by multiplying the preliminary U.S. gas price estimate for the prior month by the ratio of the five States' gas price for the latest month to that of the prior month. This estimate replaces the initial gas price estimate.

Final Monthly Data

Preliminary monthly gas price data for Kansas, Mississippi, New Mexico, Oklahoma, and Texas are replaced by final monthly data that are adjusted to match the annual prices published in the *Natural Gas Annual* for each State. A revised set of the monthly U.S. gas price estimates are derived based on the monthly change in the production-weighted prices for these five States and adjusted to match the U.S. gas price published in the Natural Gas Annual.

Note 9. Balancing Item

The "balancing item" category represents the difference between the sum of the components of natural gas supply and the sum of the components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperatures and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycles and calendar periods; and imbalances resulting from the merger of data reporting systems, which vary in scope, format, definitions, and type of respondents.

Annual Data

Annual data are from the *Natural Gas Annual.* For an explanation of the methodology involved in calculating annual "balancing item" data, see the *Natural Gas Annual.*

Preliminary Monthly Data

Preliminary monthly data in the "balancing item" category are calculated by subtracting dry gas production, withdrawals from storage, supplemental gaseous fuels, and imports from total supply / disposition.

Note 10. Heating Degree-Days

Degree-days are relative measurements of outdoor air temperature. Heating degree-days are deviations of the mean daily temperature below 65 degrees Fahrenheit. A weather station recording a mean daily temperature of 40 degrees Fahrenheit would report 25 heating degree-days. There are several degree-day data bases maintained by the National Oceanic and Atmpospheric Administration. The information published in the *Natural Gas Monthly* is developed by the National Weather Service Climate Analysis Center, Camp Springs, Maryland.

The data are available weekly with monthly summaries and are based on mean daily temperatures recorded at about 200 major weather stations arond the country. The temperature information recorded at these weather stations is used to calculate Statewide degree-day averages weighted by gas home cutomers. The State figures are then aggregated into Census Divisions and into the national average.

Appendix B

Data Sources

The data in this publication are taken from survey reports authorized by the U.S. Department of Energy (DOE), Energy Information Administration (EIA) and by the Federal Energy Regulatory Commission (FERC). The EIA is the independent statistical and analytical agency within the DOE. The FERC is an independent regulatory commission within the DOE which has jurisdiction primarily in the regulation of electric utilities and the interstate natural gas industry. The EIA conducts and processes some of the surveys authorized by the FERC. Data are collected from two annual surveys and four monthly surveys.

The annual reports are the Form EIA-176, a mandatory survey of all companies that deliver natural gas to consumers or that transport gas across State lines, and the Form EIA-627, a voluntary survey completed by energy or conservation agencies in the gas-producing States.

The monthly reports include two surveys of the natural gas industry and two surveys of the electric utility industry. The natural gas industry survey is the Form EIA-191 filed by companies that operate underground storage facilities, and the Form EIA-857 filed by a sample of companies that deliver natural gas to consumers. The electric utility industry surveys are the Form EIA-759 filed by all generating electric utilities and the Form FERC-423 filed by fossil fueled plants. Responses to these four monthly surveys are mandatory.

A description of the survey respondents, reporting requirements, and processing and editing of the data is given on the following pages for each of the surveys.

Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"

Survey Design

The original version of Form EIA-176 was approved in 1980 with a mandatory response requirement. Prior to 1980, published data were based on voluntary responses to Bureau of Mines, U.S. Department of the Interior predecessor Forms BOM-6-1340-A and BOM-6-1341-A of the same title.

In 1982, the scope of the revised EIA-176 survey was expanded to collect the number of electric utility consumers in each State, volumes of gas transported to industrial and electric utility consumers, detailed information on volumes transported across State borders by the respondent for others and for the responding company, and detailed information on other disposition. These changes were incorporated to provide more complete survey information with a minimal change in respondent burden. The 1982 version of the Form EIA-176 continues to be the basis for the current version of this form.

In 1988, the Form EIA-176 was revised to include data collection for deliveries of natural gas to commercial and industrial consumers for the account of others. A short version of Form EIA-176 was also approved in 1988. Companies engaged in purchase and delivery activities but not in transportation and storage activities may file the short form. Usually, these companies are municipals handling small volumes of gas.

In 1990, the Form EIA-176 was revised to include more detailed information for gas withdrawn from storage facilities, gas added to storage facilities, deliveries of company-owned natural gas and natural gas transported for the account of others. The revised form was approved for use beginning with report year 1990.

Upon the Office of Management and Budget's approval in 1993, the Form EIA-176 was again revised. All deliveries to consumers are now categorized as firm or interruptible. Commercial and industrial consumers are further categorized as nonutility power producers or as those excluding nonutility power producers.

Data reported on this form are no longer considered proprietary. Response to the form continues to be mandatory.

Survey Universe and Response Statistics

The Form EIA-176 is mailed to all identified interstate and intrastate natural gas pipeline companies, investor and municipally owned natural gas distributors, underground natural gas storage operators, synthetic natural gas plant operators, and field, well, or processing plant operators that deliver natural gas directly to consumers (including their own industrial facilities) and/or that transport gas to, across, or from a State border through field or gathering facilities.

Each company and its parent company or subsidiaries were required to file if they met the survey specifications. The original mailing in 1996 for report year 1995 totaled 1,991 questionnaire packages. To this original mailing, 11 names were added and 61 were deleted as a result of the survey processing. Additions were the result of comparisons of the mailing list to other survey mailing lists. Deletions resulted from post office returns and determinations that companies were out of business, sold, or not within the scope of the survey. After all updates, the survey universe was 1,941 responses from approximately 1,800 companies.

Following the original mailing, second request mailing, and nonrespondents followup, 1,911 responses were entered into the data base, and there were 30 nonrespondents.

Summary of Form EIA-176 Data Reporting Requirements

The EIA-176 is a multiline schedule for reporting all supplies of natural gas and supplemental gaseous fuels and their disposition within the State indicated. Respondents file completed forms with EIA in Washington, DC. Data for the report year are due by April 1 of the following year. Extensions of the filing deadline for up to 45 days are granted to any respondent on request.

All natural gas and supplemental gaseous fuels volumes are reported on a physical custody basis in thousand cubic feet (Mcf), and dollar values are reported to the nearest whole dollar. All volumes are reported at 14.73 pounds per square inch absolute pressure (psia) and 60 degrees Fahrenheit.

Routine Form EIA-176 Edit Checks

A series of manual and computerized edit checks are used to screen the Form EIA-176. The edits performed include validity, arithmetic, and analytical checks.

The incoming forms are reviewed prior to keying. This prescan determines if the respondent identification (ID) number and the company name and address are correct, if the data on the form appear complete and reasonable, and if the certifying information is complete.

Manual checks on the data are also made. Each form is prescanned to determine that data were reported on the correct lines. The flow of gas through interstate pipelines is checked at the company level to ensure that each delivery from a State is matched with a corresponding receipt in an adjoining State.

After the data are keyed, computer edit procedures are performed. Edit programs verify the report year, State code, and arithmetic totals. Further tests are made to ensure that all necessary data elements are present and that the data are reasonable and internally consistent. The computerized edit system produces error listings with messages for each failed edit test. When problems occur, respondents are contacted by telephone and required to file amended forms with corrected data.

Other EIA Publications Referencing Form EIA-176

Data from Form EIA-176 are also published in the *Natural Gas Annual.*

Form EIA-895, "Monthly Quantity of Natural Gas Report"

Survey Design

In 1996, an annual schedule was added to the Form EIA-895 to replace the Form EIA-627. Data collection on the Form EIA-895 began in January 1995. This form was designed to replace the Interstate Oil and Gas Compact Commission (IOGCC) form, "Monthly Report of Natural Gas Production." In 1994, the IOGCC decided to discontinue collection of their form. All gas producing States are requested to report on the Form EIA-895; a voluntary report. Data are reported by State agencies. The form was designed to provide a standard reporting system, to the extent possible, for the natural gas data reported by the States. Data are not considered proprietary.

Beginning with 1980, natural gas production data previously obtained on an informal basis from State conservation agencies were collected on Form EIA-627. This form was designed by EIA to collect annual natural gas production data from the appropriate State agencies under a standard data reporting system within the limits imposed by the diversity of data collection systems of the various producing States. The form was redesigned in 1990 to collect monthly breakdowns of all annual data elements. Data are not considered proprietary. It was also designed to avoid duplication of effort in collecting production and value data by producing States and to avoid an unnecessary respondent burden on gas and oil well operators. In 1993, value and associated volume of marketed production by month was added to the EIA-627. In 1996, the Form EIA-627 was discontinued. The information is collected on an annual schedule on the Form EIA-895.

Survey Universe and Response Statistics

Form EIA-895 is mailed to energy or conservation agencies in all 33 natural gas producing States. All producing States participate voluntarily in the EIA-895 survey by filing the completed form or by responding to telephone contacts.

Reports on State production are due 20 days after the end of the report month. (In most cases, the data are not available to the States until after this time period. Therefore, States are requested to send the report within 80 days after the end of the report month.) The annual schedule of the Form EIA-895 is due with the December data report.

Summary of Data Requirements

The Form EIA-895 monthly schedule consists of nine questions on one page, and requires volumetric information on gross production (gas and oil wells individually), gas used for repressuring, gas vented and flared, nonhydrocarbon gases removed, natural gas used as fuel on leases, marketed production, value based marketed production and the value in dollar amount of the marketed production.

Form EIA-895 annual schedule collects data on the monthly and annual production volume of natural gas (including gross withdrawals from both gas and oil wells); volumes returned to formation for repressuring, pressure maintenance, and cycling; quantities vented and flared; quantities of nonhydrocarbon gases removed; quantities of fuel used on leases; marketed production; the value of marketed production; and the number of producing gas wells.

Respondents are asked to report all volumes in thousand cubic feet at the State's standard pressure base and at 60 degrees Fahrenheit. All dollar values are reported in thousands.

Routine Form EIA-895 Edit Checks

Each filing of Form EIA-895 is manually checked for reasonableness and mathematical accuracy. Information on the forms is compared to totals of monthly data reported. Volumes are converted, as necessary, to a standard 14.73 psia pressure base. Reasonableness of data is assessed by comparing reported data to the previous year's data. State agencies are contacted by telephone to correct errors. Amended filings or resubmissions are not a requirement, since participation in the survey is voluntary.

Other EIA Publications Referencing Form EIA-895

Data from Form EIA-895 are also published in the EIA publication, *Natural Gas Annual.*

EIA-191 Survey, "Underground Natural Gas Storage Report"

Survey Design

The Form EIA-191, "Underground Natural Gas Storage Report," was revised effective January 1994. Among the changes from the form used from 1991 through 1993 are a distinction between a monthly and annual survey. Prior to 1991, data on the storage of natural gas were collected on a survey jointly implemented in 1975 by the Federal Power Commission (FPC), the Federal Energy Administration (FEA), and the Bureau of Mines (BOM) as the FPC-8/ FEA-G-318 system. The data received on both the FPC-8 and FEA-G-318 were computerized and aggregated by FPC. The form was previously revised in 1991 to include storage data by State, field, and reservoir.

At the beginning of 1979, the EIA assumed responsibility for the collection, processing, and publication of the data gathered in the survey. Form FEA-G-318 was renewed on July 1, 1979, as Form EIA-191 and the survey was retitled the FPC-8/EIA-191 Survey (Figure D4 shows the EIA-191). Form FPC-8 was renewed in December 1985 and the survey retitled FERC-8/EIA-191 Survey. The forms were not merged because of FERC's stated desire to maintain the separate identity of the FERC-8 for administrative reasons. In September 1995, the FERC discontinued the reporting requirements of Form FERC-8. FERC jurisdictional firms will continue to file Form EIA-191.

Survey Universe and Response Statistics

The 103 companies that operate underground facilities will file the Form EIA-191. Of these companies, 42 are subject to the jurisdiction of FERC and are required to report data on Form EIA-191.
The response rate as of the filing deadline is approximately 20 percent. Data from the remaining 80 percent of respondents are received in writing and/or by telephone within 3 to 4 days after the filing deadline. All data supplied by telephone are subsequently filed in writing, generally within 15 days of the filing deadline. The final response rate is 100 percent.

Summary of EIA-191 Data Reporting Requirements

The EIA-191 monthly schedule contains current month and prior month's data on the total quantities of gas in storage, injections and withdrawals, the location (including State and county, field, reservoir) and peak day withdrawals during the reporting period. Prior month's data are required only when data are revised. Information on co-owners of storage fields has been eliminated. The annual schedule contains type of facility, storage field capacity, maximum deliverability and pipelines to which each field is connected. The annual schedule is filed with the January submission.

Collection of the survey is on a custody basis. Information requested must be provided within 20 days after the first day of each month. Twelve reports are required per calendar year. Respondents are required to indicate whether the data reported are actual or estimated. For most of the estimated filings, the actual data or necessary revisions are reflected in the prior month section of the monthly form. Actual data on natural gas injections and withdrawals from underground storage are based on metered quantities. Data on quantities of gas in storage and on storage capacity represent, in part, reservoir engineering evaluations. All volumes are reported at 14.73 psia and 60 degrees Fahrenheit.

Routine Form EIA-191 Edit Checks

Data received on Form EIA-191 are entered into the survey processing system. The survey's five principal data elements (total, base, working gas in storage, injections, and withdrawals) receive a preliminary visual edit to eliminate and correct obvious errors or omissions. Respondents are required to refile reports containing any inconsistencies or errors.

Other EIA Publications Referencing Form EIA-191

The EIA publication *Monthly Energy Review* and *Winter Fuels Report* contain data from the EIA-191 survey.

"Quarterly Natural Gas Import and Export Sales and Price Report"

Survey Design

The collection of data covering natural gas imports and exports was begun in 1973 by the Federal Power Commission (FPC). On October 1977, FPC ceased to exist and its data collection functions were transferred to the Federal Energy Regulatory Commission (FERC) within the Department of Energy (DOE). From 1979 to 1994, the Energy Information Administration (EIA) has had the responsibility for collecting Form FPC-14, "Annual Report for Importers and Exporters of Natural Gas." Data are not considered proprietary. The Form FPC-14 was discontinued in 1995.

Beginning in 1995, import and export data are taken from the "Quarterly Natural Gas Import and Export Sales and Price Report." This report is prepared by the Office of Fossil Energy, U.S. Department of Energy, based on information submitted by all firms having authorization to import or export natural gas.

Survey Universe and Response Statistics

All companies are required, as a condition of their authorizations to import or export natural gas, to file quarterly reports with the Office of Fossil Energy. These data are collected as part of its regulatory responsibilities. The data are reported at a monthly level of detail. Data reported on the Form FPC-14 represented physical movements of natural gas. Data collected by the Office of Fossil Energy are reported on an equity (sales) basis. For 1994 and earlier years, comparisons of the data from the two sources may show differences because reporting requirements were different.

Prior to 1995, the Form FPC-14 was filed annually by each organization or individual having authority to import and export natural gas regardless of whether any activity took place during the reporting year. Authorizations to import and export was originally granted by the FPC. In 1977, the authority to grant authorizations transferred to the Economic Regulatory Administration (ERA). It now resides with the Office of Fossil Energy, U.S. Department of Energy.

Routine Edit Checks

Respondents are required to certify the accuracy of all data reported. The data are checked for reasonableness and accuracy. If errors are found, the companies are required to file corrected data. The data are compared with data reported by the National Energy Board of Canada and are published quarterly. All natural gas volumes in this report are expressed at a pressure base of 14.73 pounds per square inch absolute and temperature of 60 degrees Fahrenheit, except as noted. All import and export prices are in U.S. dollars and, except for LNG exports, are those paid at the U.S. border. LNG export prices are those paid at the point of sale and delivery in Yokohama, Japan.

Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"

Survey Design

The original Form EIA-857 was approved for use in December 1984. Response to the Form EIA-857 is mandatory on a monthly basis. Data collected on the Form EIA-857 cover the 50 States and the District of Columbia and include both price and volume data. Data are considered proprietary.

Survey Universe and Response Statistics

A sample of 382 natural gas companies, including interstate pipelines, intrastate pipelines, and local distribution companies, report to the survey. The sample was selected independently for each of the 50 States and the District of Columbia from a frame consisting of all respondents to Form EIA-176 who reported deliveries of natural gas to consumers in the residential, commercial, or industrial sectors. Each selected company is required to complete and file the Form EIA-857 on a monthly basis. Initial response statistics on a monthly basis are as follows: responses received by due date, approximately 50 percent, and responses received after follow-up, 100 percent. Virtually all are received in time for incorporation in the current month's processing cycle. When a response is extremely late, and the company represents less than 25 percent of the natural gas volumes delivered by all sampled companies in the State, values are imputed as described in Appendix C. When the company's submission is eventually received, the submitted data are used for future processing and revisions.

The Form EIA-857 is a monthly sample survey of firms delivering natural gas to consumers. It provides data that are used to estimate monthly sales of natural gas (volume and price) by State and monthly deliveries of natural gas on behalf of others (volume) by State to three consumer sectors - residential, commercial, and industrial. (Monthly deliveries and prices of natural gas to electric utilities are reported on the Form FERC-423, "Monthly Report of Cost and Quality of Fuels for Electric Plants," and the Form EIA-759, "Monthly Power Plant Report.") See Appendix C for a discussion of the sample design and estimation procedures.

Summary of Form EIA-857 Data Reporting Requirements

Data collected monthly on the Form EIA-857 on a State level include the volume and cost of purchased gas, the volume and cost of natural gas consumed by sector (residential, commercial, and industrial), and the average heat content of all gas consumed. Respondents file completed forms with EIA in Washington, DC on or before the 30th day after the end of the report month.

All natural gas volumes are reported in thousand cubic feet at 14.73 psia at 60 degrees Fahrenheit and dollar values are reported to the nearest whole dollar.

Routine Form EIA-857 Edit Checks

A series of manual and computerized edit checks are used to screen the Form EIA-857. The edits performed include validity and analytical checks.

Appendix C

Statistical Considerations

The monthly sales (volume and price) and monthly deliveries (volume) of natural gas to residential, commercial and industrial consumers presented in this report by State are estimated from data reported on the Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers." (See Appendix B for a description of this Form.) These estimations must be made from the reported data since the Form EIA-857 is a sample survey. A description of the sample design and the estimation procedures is given below.

Sample Design

The Form EIA-857 is a monthly sample survey of companies delivering natural gas to consumers. It includes inter- and intrastate companies, and producers, as well as local distribution companies. The survey provides data that are used each month to estimate the volume of natural gas delivered and the price for onsystem sales of natural gas by State to three consumer sectors--residential, commercial, and industrial. Monthly deliveries and prices of natural gas to electric utilities are reported on the Form EIA-759, "Monthly Power Plant Report," and the Form FERC-423, "Monthly Report of Costs and Quality of Fuels for Electric Plants."

Sample Universe. The sample currently in use was selected from a universe of 1,538 companies. These companies were respondents to the Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition," for reporting year 1995 who reported sales or deliveries to consumers in the residential, commercial or industrial sectors. (See Appendix B for a description of the Form EIA-176.)

Sampling Plan. The goal was a sample that would provide estimates of monthly natural gas consumption by the three consuming sectors within each State and the District of Columbia. A stratified sample using a single stage and systematic selection with probability proportional to size was designed. The measure of size was the volume of natural gas physically delivered in the State to the three consuming sectors by the company in 1995. There were two strata--companies selected with certainty and companies selected under the systematic probability proportional to size design.

Initial calculations showed that a 25 percent sample of companies would yield reasonably accurate estimates. The sample was selected independently in each State, resulting in a national total of 387 respondent companies. Unlike previous years, no mergers or acquisitions were uncovered as a result of the initial mail-out. Therefore there was no need for either substitution of respondent companies or a reduction in the total number of respondents.

Certainty Stratum. Since estimates were needed for each of the 50 States and the District of Columbia, the strata were established independently within each State. In 16 States and the District of Columbia where sampling was not feasible due to small numbers of companies and / or small volumes of gas deliveries, all companies were selected. The 16 States were: Alaska, Connecticut, Delaware, Hawaii, Idaho, Maine, North Dakota, New Hampshire, New Jersey, Nevada, Oregon, Rhode Island, South Dakota, Utah, Vermont, and Washington.

For each of the remaining States, the total volumes of industrial sales and deliveries and of the combined residential / commercial sales and deliveries were determined. Companies with natural gas deliveries to the industrial sector or to the combined residential / commercial sector above a certain level were selected with certainty. Since a few large companies often account for most of the natural gas delivered within a State, this ensures those companies' inclusion in the sample. The formula for determining certainty was applied independently in the two consumer sectors--the industrial and the combined residential / commercial. These selected companies, together with the companies in the jurisdictions discussed where sampling was not feasible, formed the certainty stratum.

All companies with natural gas deliveries in sector j greater than the cut-off value ($C_{.j}$) were included in the certainty stratum. The formula for $C_{.j}$ was:

$$C_{.j} = \frac{X_{.j}}{2n} \qquad (1)$$

where:

$C_{.j}$ = cutoff value for consumer sector j,

n = target sample size to be selected for the State, 25 percent of the companies in the State,

X_{ij} = the annual volume of natural gas deliveries by company i to customers in consumer sector j,

$X_{i.}$ = the sum within State of annual gas volumes for company i,

$X_{.j}$ = the sum within State of annual gas volumes in consumer sector j,

$X..$ = the sum within State of annual gas volumes in all consumer sectors.

Noncertainty Stratum. All other companies formed the noncertainty stratum. They were systematically sampled with probability proportional to size. The measure of size for each company was the total volume of gas sales to all consumer sectors ($X_{i.}$). The number of companies to be selected from the noncertainty stratum was calculated for each State, with a minimum of 2.

The formula for selecting the number of noncertainty stratum companies was:

$$m = n\frac{X2}{X..} \qquad (2)$$

where:

m = the sample size for the noncertainty stratum within a State,
X2 = the sum within State of the $X_{i.}$ for all companies in the noncertainty stratum.

Companies were listed in ascending order according to their measure of size and then a cumulative measure of size in the stratum was calculated for each company. The cumulative measure of size was the sum of the measures of size for that company and all preceding companies on the list. An interval of width I for selecting the companies systematically was calculated using $(I = \frac{X2}{m})$. A uniform random number R was selected between zero and I. The first sampled company was the first company on the list to have a cumulative measure of size greater than R. The second company selected was the first company on the list to have a cumulative measure of size greater than R + I. R + I was increased again by I to determine the third company to be selected. This procedure was repeated until the entire sample was drawn.

Subgroups. In eight States, the noncertainty stratum was divided into subgroups to ensure that gas in each consumer sector could be estimated. The systematic sample with probability proportional to size design described above was applied independently in each subgroup. The methods for determining the subgroup sample size and calculating the subgroup interval for sample selection were the same as the methods described above for the noncertainty stratum, except that X2 was the sum within State of the $X_{i.}$ for only those companies in the subgroup.

These subgroups were defined only for the purpose of sample selection. They are:

California: companies handling only industrial gas and all other companies.

Iowa: companies handling industrial gas and companies delivering only to residential or commercial customers.

Louisiana: companies handling only industrial gas and all other companies, with the latter being further subdivided according to size. The larger group is comprised of all companies with total deliveries of at least 200 million cubic feet while the smaller group consists of companies with less than that volume of delivered gas (three subgroups).

Oklahoma: Companies delivering less than 500 million cubic feet of gas and those delivering more than that volume.

Texas: companies handling only residential/commercial gas, companies handling only industrial gas, and all other companies (three subgroups).

Estimation Procedures

Estimates of Volumes. A ratio estimator is applied to the volumes reported in each State by the sampled companies to estimate the total gas sales and deliveries for the State. Ratio estimators are calculated for each consumer sector—residential, commercial, and industrial—in each State where companies are sampled.

The following annual data are taken from the most recent 1995 submissions of Form EIA-176:

The formula for calculating the ratio estimator (E_{vj}) for the volume of gas in consumer sector j is:

$$E_{vj} = \frac{Y_j}{Y'_j} \qquad (3)$$

where:

Y_j = the sum within State of annual gas volumes in consumer sector j for all companies,

Y'_j = the sum within State of annual gas volumes in consumer sector j for those companies in the sample.

The ratio estimator is applied as follows:

$$V_j = y_j \times E_{vj} \qquad (4)$$

where:

V_j = the State estimate of monthly gas volumes in consumer sector j,

y_j = the sum within State of reported monthly gas volumes in consumer sector j.

Computation of Natural Gas Prices. The natural gas volumes that are included in the computation of prices represent only those volumes associated with natural gas sales.

The price of natural gas for a State within a sector is calculated as follows:

$$P_j = \frac{R_j}{V'_j}$$

where:

P_j = the average price for gas sales within the State in consumer sector j,

R_j = the reported revenue from natural gas sales within the State in consumer sector j,

V_j = the reported volume of natural gas sales within the State in consumer sector j.

All average prices are weighted by their corresponding sales volume estimates when national average prices are computed.

The monthly average prices of natural gas are based on sales data only. Volumes of gas delivered for the account of others to these consumer sectors are not included in the State or national average prices.

Table 28 shows the percent of the total State volume that represents volumes from natural gas sales to the commercial and industrial sectors. This table may be helpful in evaluating commercial and industrial price data. Virtually all natural gas deliveries to the residential sector represent onsystem sales volumes only.

See the section on consumer price calculations in this Appendix for further price information.

Estimation for Nonrespondents. A volume for each consumer category is imputed for companies that fail to respond. The imputation is based on the previous month's value reported by the non-responding company and the change from the previous month to the current month in volumes reported by other companies in the State. The imputed volumes are included in the State totals. To estimate prices for non-respondents, the unit price (dollars per thousand cubic feet) reported by the company in the previous month is used.

The formula for imputing volumes of gas sales for nonrespondents was:

$$F_t = F_{t-1} \times \frac{y_{jt}}{y_{j}t-1} \qquad (5)$$

where:

F_t = imputed gas volume for current month t,

F_{t-1} = gas volume for the company for the previous month,

y_{jt} = gas volume reported by companies in the State stratum for report month t,

$y_{j}t-1$ = gas volume in the previous month for companies in the State stratum that reported in month t.

Final Revisions

Adjusting Monthly Data to Annual Data. After the annual data reported on the Form EIA-176 have been submitted, edited, and prepared for publication in the *Natural Gas Annual*, revisions are made to monthly data. The revisions are made to the volumes and prices of natural gas delivered to consumers that have appeared in the *Natural Gas Monthly* to match them to the annual values appearing in the *Natural Gas Annual.*

The revised monthly estimates allocate the difference between the sum of monthly estimates and the annual reports according to the distribution of the estimated values across the months.

Before the final revisions are made, changes or additions to submitted data received after publication of the monthly estimate and not sufficiently large to require a revision to be published in the *Natural Gas Monthly*, are used to derive an updated estimate of monthly consumption and revenues for each State's residential, commercial, or industrial natural gas consumption.

For each State, two numbers are revised, the estimated consumption and the estimated price per thousand cubic feet.

The formula for revising the estimated consumption is:

$$V^{*}_{jm} = V_{jm} + \left[(V_{ja} - V'_{jm}) \left(\frac{V_{jm}}{V'_{jm}} \right) \right] \qquad (6)$$

where:

V^{*}_{jm} = the final volume estimate for month m in consumer sector j,

V_{jm} = the estimated volume for month m in consumer sector j,

V_{ja} = the volume for the year reported on Form EIA-176,

V'_{jm} = The annual sum of estimated monthly volumes.

The price is calculated as described above in the Estimation Procedures section, using the final revised consumption estimate and a revised revenue estimate.

The formula for revising the estimated revenue is:

$$R^{*}_{jm} = R_{jm} + \left[(R_{ja} - R'_{jm}) \left(\frac{R_{jm}}{R'_{jm}} \right) \right] \qquad (7)$$

where:

R^{*}_{jm} = the final revenue estimate for month m in consumer sector j,

R_{jm} = the estimated revenue for month m in consumer sector j,

R_{ja} = the revenue for the year reported on Form EIA-176,

R'_{jm} = The annual sum of estimated monthly revenues.

Revision of Volumes and Prices for Deliveries to Electric Utilities. Revisions to monthly electric utilities data are published throughout the year as they become available.

Reliability of Monthly Data

The monthly data published in this report are subject to two sources of error - nonsampling error and sampling error. Nonsampling errors occur in the collection and processing of the data. See the discussion of the Form EIA-857 in Appendix B for a description of nonsampling errors for monthly data.

Sampling error may be defined as the difference between the results obtained from a sample and the results that a complete enumeration would provide. The standard error statistic is a measurement of sampling error.

Standard Errors. A standard error of an estimate is a statistical measure that indicates how the estimate from the sample compares to the result from a complete enumeration. Standard errors are calculated based on statistical theory that refers to all possible samples of the same size and design.

The standard errors for monthly natural gas volume estimates by State are given in Table C1. Ninety-five percent of the time, the volume that would have been obtained from a complete enumeration will lie in the range between the estimated volume minus two standard errors and the estimated volume plus two standard errors.

The standard error of the natural gas volume estimate is the square root of the variance of the estimate. The formula for calculating the variance of the volume estimate is:

$$V(\hat{Y}) = \sum_{h=1}^{H} \left[N_h^2 \frac{\left(1 - \frac{n_h}{N_h}\right)}{n_h (n_h - 1)} \left(\sum_{i=1} (y_i - T x_i)^2 \right) \right] \qquad (8)$$

where:

H = the total number of strata

N_h = the total number of companies in stratum h
n_h = the sample size in stratum h
y_i = the reported monthly volume for company i

x_i = the reported annual volume for company i

T = the ratio of the sum of the reported monthly volumes for sample companies to the sum of the reported annual volumes for the sample companies.

Table C-1. Standard Error for Natural Gas Deliveries and Price to Consumers by State, May 1997

State	Volume Million Cubic Feet				Price Dollars per Thousand Cubic Feet		
	Residential	Commercial	Industrial	Total	Residential	Commercial	Industrial
Alabama	187	233	1,580	1,608	0.10	1.24	0.58
Alaska	0	0	0	0	—	—	—
Arizona	31	22	0	38	0.08	0.08	—
Arkansas	0	0	0	0	—	—	—
California	19	37	414	416	0.04	0.02	—
Colorado	NA	NA	NA	NA	NA	NA	NA
Connecticut	0	0	0	0	—	—	—
Delaware	0	0	0	0	—	—	—
District of Columbia	0	0	0	0	—	—	—
Florida	137	216	327	415	0.48	0.63	0.24
Georgia	385	27	854	937	0.84	0.19	4.38
Hawaii	0	0	0	0	—	—	—
Idaho	0	0	0	0	—	—	—
Illinois	3,235	2,029	1,944	4,286	0.29	0.72	0.54
Indiana	1,074	2,699	2,690	3,959	0.26	0.97	0.42
Iowa	322	56	44	330	0.52	0.08	0.18
Kansas	919	688	41,211	41,227	1.24	1.09	8.21
Kentucky	276	240	79	374	0.28	0.42	1.38
Louisiana	73	53	NA	NA	0.08	0.13	NA
Maine	0	0	0	0	—	—	—
Maryland	NA	NA	NA	NA	NA	NA	NA
Massachusetts	359	1,302	7,300	7,423	0.45	0.65	0.79
Michigan	990	895	3,398	3,650	0.28	0.27	0.69
Minnesota	445	262	829	977	0.13	0.14	0.29
Mississippi	NA	NA	NA	NA	NA	NA	NA
Missouri	569	134	581	824	0.51	0.19	0.85
Montana	1	0	0	1	—	—	—
Nebraska	NA	NA	106	NA	NA	NA	0.29
Nevada	0	0	0	0	—	—	—
New Hampshire	0	0	0	0	—	—	—
New Jersey	0	0	0	0	—	—	—
New Mexico	303	387	530	723	0.36	0.57	—
New York	NA	NA	NA	NA	NA	NA	NA
North Carolina	7	428	759	871	0.02	0.42	0.24
North Dakota	0	0	0	0	—	—	—
Ohio	0	0	0	0	—	—	—
Oklahoma	111	2,511	1,209	2,789	0.13	3.29	0.15
Oregon	0	0	0	0	—	—	—
Pennsylvania	856	2,013	1,121	2,458	0.10	0.41	4.55
Rhode Island	0	0	0	0	—	—	—
South Carolina	217	40	203	300	0.31	0.28	0.07
South Dakota	NA	NA	NA	NA	NA	NA	NA
Tennessee	225	242	1,042	1,094	0.42	0.13	0.34
Texas	772	NA	5,215	NA	0.29	NA	0.01
Utah	0	0	0	0	—	—	—
Vermont	0	0	0	0	—	—	—
Virginia	168	329	1,821	1,858	0.45	0.98	1.04
Washington	0	0	0	0	—	—	—
West Virginia	2,319	494	80	2,372	1.15	0.69	0.20
Wisconsin	NA	NA	231	NA	NA	NA	0.67
Wyoming	NA	NA	NA	NA	NA	NA	NA
Total	4,963	5,304	43,031	43,640	0.09	0.15	0.79

NA = Not Available.
— = Not Applicable.
Source: Energy Information Administration, Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers."

Appendix D

Natural Gas Reports and Feature Articles

Reports Dealing Principally with Natural Gas and/or Natural Gas Liquids

- *Natural Gas Annual 1995*, DOE/EIA-0131(95), November 1996.
- *Natural Gas Annual 1993 Supplement: Company Profiles*,DOE/EIA-0131(93/S), February 1995.

Other Reports Covering Natural Gas, Natural Gas Liquids, and Other Energy Sources

- *Monthly Energy Review*, DOE/EIA-0035. Published monthly. Provides national aggregate data for natural gas, natural gas liquids, and other energy sources.
- *Short-Term Energy Outlook*, DOE/EIA-0202. Published quarterly. Provides forecasts for next six quarters for natural gas and other energy sources.
- *Natural Gas 1995: Issues and Trends*, DOE/EIA-0560(95), November 1995.
- *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves - 1995 Annual Report*, DOE/EIA-0216(95)/Advance Summary, October 1996.
- *Annual Energy Review 1995*, DOE/ EIA-0384(95), July 1996. Published annually.
- *Annual Report to Congress 1995 DOE/ EIA-01733(95), July 1996. Published annually.*
- *Annual Energy Outlook 1996*, DOE/ EIA-0383(96), January 1996. Published annually.

Selected One-Time Natural Gas and Related Reports

- *The Value of Underground Storage in Today's Natural Gas Industry*, DOE/EIA-0591, March 1995.
- *Natural Gas Productive Capacity for the Lower 48 States, 1980 through 1995*, DOE/EIA-0542(95), July 1994.
- *Largest U.S. Oil and Gas Fields*, DOE/EIA-TR-0567, August 1993.
- *Energy Policy Act Transportation Rate Study*, DOE/EIA-0571, October 1993.
- *Energy Policy Act Transportation Study: Interim Report of Natural Gas Flows and Rates*, DOE/EIA-0602, October 1995.

Selected and Recurring Natural Gas and Related Data Reference Reports

- *Directory of Energy Data Collection Forms*, DOE/EIA-0249(95), January 1996.
- *Oil and Gas Field Code Master List, 1995*, EIA-0370(95), December 1996.

Feature Articles

January 1994

U.S. Coalbed Methane Production

(Updates the Energy Information Administration's coalbed methane production information through 1992 and presents it by geologic basin and by State.)

February 1994

Contracting for Natural Gas Supplies

(Addresses the contractual relationships of producers with end users and distributors for the natural gas that is shipped along the interstate pipeline systems.)

May 1994

Opportunities with Fuel Cells

(Discusses the uses of fuel cells in todays market.)

Revisions to Monthly Natural Gas Data

(Discusses the revision errors for natural gas data.)

June 1994

Natural Gas 1994: Issues and Trends - Executive Summary

(Provides an overview of the natural gas industry in 1993 focusing on trends in production, consumption, and pricing of natural gas.)

August 1994

U.S. Natural Gas Imports and Exports - 1993

(Contains final 1993 data on all U.S. imports and exports of natural gas.)

March 1995

The Comparability of Resource and Reserve Data for Crude Oil, Natural Gas, Coal, and Uranium

(Clarifies which terms are equivalent among the four major energy minerals in the United States.)

July 1995

Revisions to Monthly Natural Gas Data

(Discusses the revision errors for natural gas data.)

June 1996

Natural Gas Industry Restructuring and Data Collection

(Discusses how restructuring of the natural gas industry has impacted the natural gas data collection efforts.)

July 1996

Revisions to Monthly Natural Gas Data
(Discusses the revision errors for natural gas data.)

November 1996

U.S. Natural Gas Imports and Exports - 1995

(Contains final 1995 data on all U.S. imports and exports of natural gas.)

December 1996

Crosswell Seismology -- A View from Aside

(Discusses crosswell seismology and its geologic and economic implications for the domestic oil and gas industry.)

May 1997

Restructuring Energy Industries: Lessons from Natural Gas

(Compares and contrasts the natural gas and electric power industries.)

July 1997

Intricate Puzzle of Oil and Gas "Reserves Growth"

(Discusses the factors that affect ultimate recovery estimates of a field or reservoir.)

Special Focuses

January 1997

Natural Gas Productive Capacity

(Analyzes monthly natural gas wellhead productive capacity in the lower 48 States from 1985 and 1996 and project this capacity for 1996 and 1997.)

Outlook for Natural Gas Through 2015

(Presents an outlook for natural gas through 2015.)

Special Reports

March 1997

Natural Gas Analysis and Geographic Information Systems

(Explores how geographic information system techniques and methodologies are being used by the Energy Information Administration.)

April 1997

Natural Gas Pipeline and System Expansions

(Examines recent expansions to the North American natural gas pipeline network.)

July 1997

Revisions to Monthly Natural Gas Data
(Discusses the revision errors for natural gas data.)

Natural Gas 1996: Highlights

(Reviews data for 1996 based on Energy Information Administration surveys.)

Appendix E

Technical Contacts

Section	Tables		Principal Data Sources	Technical Contact
Summary Statistics:				
Natural Gas Production	1, 2, 3	Monthly: Annual:	EIA-895, "Monthly Quantity of Natural Gas Report"	Audrey E. J. Corley (202) 426-1159
		Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 426-1318
Extraction Loss	1	Monthly: Annual:	EIA computations Form EIA-816, "Monthly Natural Gas Liquids Report" and Form EIA-64A, "Annual Report of the Origin of Natural Gas Liquids Production"	Margo Natof (202) 586-6303
Supplemental Gaseous Fuels	2	Monthly: Annual:	EIA computations Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition"	Audrey E. J. Corley (202) 586-6113 Margo Natof (202) 586-6303
Imports and Exports	2	Monthly: Annual:	EIA computations Office of Fossil Energy, U.S. Department of Energy, "Natural Gas Import and Exports"	Norman Crabtree (202) 586-6180
Price:				
City Gate, Residential, Commercial, and Industrial	4	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 426-1318
Wellhead	4	Monthly: Annual:	EIA computations Form EIA-895, "Monthly Quantity and Value of Natural Gas Report"	Eva M. Fleming (202) 586-6113
Electric Utility	4	Monthly:	Form FPC-423, "Cost and Quality of Fuels for Electric Power Plants"	Roy Kass (202) 426-1318
Summary of Natural Gas Imports and Exports	5,6	Monthly:	Quaterly Natural Gas Import and and Export Sales and Price Report	Norman Crabtree (202) 586-6180
Producer Related Activities:				
Natural Gas Production	7,8	Monthly:	EIA-895, "Monthly Quantity of Natural Gas Report"	Audrey Corley (202) 426-1159

Underground Storage:	9, 10, 11 12, 13	Monthly:	Forms FERC-8 and EIA-191, "Underground Gas Storage Report"	Roy Kass (202) 426-1318
Distribution and Consumption:				
Deliveries to:				
Residential,	14	Monthly:	Form EIA-857, "Monthly Report of	Roy Kass
Commercial,	15		Natural Gas Purchases and Deliveries	(202) 426-1318
Industrial,	16		to Consumers"	
Electric Utility,	17		Form FERC-423, "Cost and Quality	
All Consumers	18		of Fuels for Electric Power Plants"	
Average Price to:				
City Gate,	19	Monthly:	Form EIA-857, "Monthly Report of	Roy Kass
Residential,	20		Natural Gas Purchases and Deliveries	(202) 426-1318
Commercial,	21		to Consumers"	
Industrial,	22		Form FERC-423, "Cost and Quality	
Electric Utility	23		of Fuels for Electric Power Plants"	
Onsystem Sales	24	Monthly:	Form EIA-857, "Monthly Report of Natural Gas Purchases and Deliveries to Consumers"	Roy Kass (202) 426-1318
Heating Degree Days	25	Seasonal:	National Oceanic and Atmospheric Administration	James Keeling (202) 586-6107
Highlights				Mary Carlson (202) 586-4749

Natural Gas Electronic Products

In addition to printed publications, the Energy Information Administration distributes information concerning the natural gas industry in a variety of electronic formats through several media. Two main types of products are available electronically: *viewable documents* that may be read or printed; and *post-processable files* that may be directly used as input to a computer application without additional keying and checking of data.

Viewable documents represent complete or selected sections of publications including text, tables and graphs. They may be as specific as single tables or as general as an entire publication. Post-processable documents on the other hand are either macro-level representations of information in published tables or micro-level respondent information representing responses on a specific nonconfidential survey.

The media used to distribute these electronic publications include: (1) The Energy Information Administration's Internet site (http://www.eia.doe.gov or ftp://ftp.eia.doe.gov); (2) Dial-in access through the Energy Information Administration's EPUB electronic bulletin board or through the Economic Bulletin Board of the Department of Commerce and the COGIS system; (3) The Energy Information Administration's quarterly CD-ROM(Info-Disk); (4) The Energy Information Administration's Fax on Demand System; and (5) diskettes.

	Internet	Dial-In	InfoDisk	Fax	Diskette
ANNUAL PUBLICATIONS					
Natural Gas Annual, Volume 1, 1994 Provides information on supply, and disposition of natural gas in the United States.Information is provided nationally, regionally, and by State for 1994.	V P		V P		P
Natural Gas Annual, Volume 2, 1994 Contains historical information about supply and disposition of natural gas at the national, regional, and State level as well as prices at selected points in the flow of gas from wellhead to burnertip.	P		P		P
Natural Gas 1995: Issues and Trends Addresses current issues affecting the natural gas industry and markets, and analyzes trends in the most recent natural gas data.	V		V		
Natural Gas 1994: Issues and Trends Provides an overview of the natural gas industry in 1993 and early 1994, focusing on the overall ability to deliver gas under the new regulatory mandates of the Federal Energy Regulatory Commission's Order 636.	V		V		
Oil and Gas Products List 1994-1995 Brief descriptions of the various information products prepared by the Office of Oil and Gas.	V		V		
U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves Annual Report 1994 1994 national and State estimates of reserves, reserve changes, and production, plus industry highlights.	V		V		
MONTHLY PUBLICATIONS					
Natural Gas Monthly, from September 1995 forward. Entire Publication in viewable format	V		V		

V=Viewable P=Post-Processable

	Internet	Dial-In	InfoDisk	Fax	Diskette
OTHER PUBLICATIONS					
Natural Gas 1995: Preliminary Highlights This Special Focus, which was featured in the April 1996 issue of the *Natural Gas Monthly*, presents events that affected the natural gas industry during 1995.	V	P		V	
Energy Policy Act Transportation Study: Interim Report on Natural Gas Flow and Rates (EPACT) Analysis of natural gas transportation rates and distribution patterns for the period from 1988 through 1994.	V		V		
Oil Production Capacity Expansion Cost for the Persian Gulf Quantifies the cost of expanding oil production capacity for the Persian Gulf based on geologic plays and fields rather than country-level economics. Development costs and volumes are estimated for the next 15 years.	V		V		
Costs and Indices for Domestic Oil and Gas Field Equipment and Production Operations 1990-1993 Cost of equipment and operation of oil and gas wells in the lower 48 States.	V		V		
Drilling Sideways- A Review of Horizontal Well Technology and the Domestic Application April 1993 report presenting salient aspects of current and near-future horizontal drilling and completion technology.	V		V		
International Oil and Gas Exploration and Development Compilation of country-level data and assessment of regional trends relating to upstream aspects of global oil and gas supply.	V		V		
Natural Gas Productive Capacity for the Lower 48 States 1984-1996 Analysis of monthly natural gas wellhead productive capacity.	V		V		
Natural Gas Productive Capacity for the Lower 48 States 1980-1995 Analysis of monthly natural gas wellhead productive capacity.	V		V		
Oil and Gas Field Code Master List Comprehensive listing of U.S. oil and gas field names as of November 1995.	V		V		
Oil and Gas Resources of the Fergana Basin (Uzbekistan, Tadzhikistan, and Kyrgysztan) Reservoir level assessments of oil and gas ultimate recovery in the former Soviet Union area.	V		V		
The Value of Underground Storage in Today's Natural Gas Industry Explores the significant and changing role of storage in the industry.	V		V		
U.S. Oil and Gas Development in the Early 1990's Analyses of the growing prominence of smaller energy companies in U.S. oil and gas production	V		V		
ANNUAL DATA					
Natural Gas Supply and Disposition, by State 1994	V P	V P		V	

V=Viewable P=Post-Processable

	Internet	Dial-In	InfoDisk	Fax	Diskette
Natural Gas Summary, United States by Year 1990-1994	V P	V P		V	
1994 Natural Gas Annual Volume 1 data Self-extracting file containing data (in comma-delimited format) that appear in the tables in Volume I of the 1994 *Natural Gas Annual*.	P		P		P
1994 Natural Gas Annual Volume 2 data Self-extracting file containing historical information (in comma-delimited format) found in the tables in Volume II of the 1994 *Natural Gas Annual*. Annual historical data at the national level are presented for 1930-1994. Annual information by State and region is presented for 1967-1994.	P		P		P
1993 Data reported on Form EIA-176 A self-extracting compressed file containing data reported on Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition" for 1993.	P				P
1994 Data reported on Form EIA-176 A self-extracting compressed file containing data reported on Form EIA-176, "Annual Report of Natural and Supplemental Gas Supply and Disposition" for 1994.	P				P
Data archive of historical reserves estimates for U.S. Crude Oil, Natural Gas, and Natural Gas Liquids. National, State, and State subregion data published in the reserves balance tables of *U.S. Crude Oil, Natural Gas, and Natural Gas Liquids Reserves* from 1977 forward.	P				P
MONTHLY DATA					
Natural Gas Production, United States by Month 1989-forward	P	P		V	
Natural Gas Supply and Disposition, 1989-forward	P	P		V	
Natural Gas Imports and Exports 1989-forward	P	P		V	
Natural Gas Underground Storage: United States Total by Month 1989-forward	P	P		V	
Natural Gas Prices: United States Total by Month 1989-forward	P	P		V	
Natural Gas Consumption by Sector: United States Total by Month, 1989-forward	P	P		V	
SELF-EXTRACTING COMPRESSED DATA FILE ARCHIVES					
Natural Gas Consumption and Prices, for most recent 2-3 years	P	P			
Natural Gas Consumption and Prices, for 1984-1992	P	P			
OTHER REPORTS					
Natural Gas Weekly Market Update Analysis of current price, supply and storage data along with a two week snapshot of the weather in four distinct metropolitan areas.	V			V	

V=Viewable P=Post-Processable

Glossary

Balancing Item: Represents the difference between the sum of the components of natural gas supply and the sum of the components of natural gas disposition. These differences may be due to quantities lost or to the effects of data reporting problems. Reporting problems include differences due to the net result of conversions of flow data metered at varying temperature and pressure bases and converted to a standard temperature and pressure base; the effect of variations in company accounting and billing practices; differences between billing cycle and calendar period time frames; and imbalances resulting from the merger of data reporting systems which vary in scope, format, definitions, and type of respondents.

Base (Cushion) Gas: The volume of gas needed as a permanent inventory to maintain adequate underground storage reservoir pressures and deliverability rates throughout the withdrawal season. All native gas is included in the base gas volume.

British Thermal Unit (Btu): The heat required to raise the termperature of one pound of water by one degree Fahrenheit at or near 39.2 degrees Fahrenheit.

City-gate: A point or measuring station at which a gas distribution company receives gas from a pipeline company or transmission system.

Commercial Consumption: Gas used by nonmanufacturing organizations such as hotels, restaurants, retail stores, laundries, and other service enterprises, and gas used by local, State, and Federal agencies engaged in nonmanufacturing activities.

Depletion: The loss in service value incurred in connection with the exhaustion of the natural gas reserves in the course of service.

Depreciation: The loss in service value not restored by current maintenance, incurred in connection with the consumption or respective retirement of a gas plant in the course of service from causes that are known to be in current operation and against which the utility is not protected by insurance; for example, wear and tear, decay, obsolescence, changes in demand and requirements of public authorities, and the exhaustion of natural resources.

Dry Natural Gas Production: Marketed production less extraction loss.

Electric Utility Consumption: Gas used as fuel in electric utility plants.

Exports: Natural gas deliveries out of the continental United States and Alaska to foreign countries.

Extraction Loss: The reduction in volume of natural gas resulting from the removal of natural gas liquid constituents at natural gas processing plants.

Flared: The volume of gas burned in flares on the base site or at gas processing plants.

Gross Withdrawals: Full well stream volume, including all natural gas plant liquid and nonhydrocarbon gases, but excluding lease condensate. Also includes amounts delivered as royalty payments or consumed in field operations.

Imports: Natural gas received in the Continental United States (including Alaska) from a foreign country.

Independent Producers: Any person who is engaged in the production or gathering of natural gas and who sells natural gas in interstate commerce for resale but who is not engaged in the transportation of natural gas (other than gathering) by pipeline in interstate commerce.

Industrial Consumption: Natural gas used by manufacturing and mining establishments for heat, power, and chemical feedstock.

Interstate Companies: Natural gas pipeline companies subject to FERC jurisdiction.

Intransit Deliveries: Redeliveries to a foreign country of foreign gas received for transportation across U.S. territory and deliveries of U.S. gas to a foreign country for transportation across its territory and redelivery to the United States.

Intransit Receipts: Receipts of foreign gas for transportation across U.S. territory and redelivery to a foreign country and redeliveries to the United States of U.S. gas transported across foreign territory.

Intrastate Companies: Companies not subject to FERC jurisdiction.

Lease and Plant Fuel: Natural gas used in well, field, lease operations and as fuel in natural gas processing plants.

Liquefied Natural Gas (LNG): Natural gas that has been liquefied by reducing its temperature to minus 260 degrees Fahrenheit at atmospheric pressure.

Marketed Production: Gross withdrawals less gas used for repressuring, quantities vented and flared, and nonhydrocarbon gases removed in treating or processing operations. Includes all quantities of gas used in field and processing operations. See Explanatory Note 1 for discussion of coverage of data concerning nonhydrocarbon gases removed.

Native Gas: Gas in place at the time that a reservoir was converted to use as an underground storage reservoir as in contrast to injected gas volumes.

Natural Gas: A mixture of hydrocarbon compounds and small quantities of various nonhydrocarbons existing in the gaseous phase or solution with oi1 in natural underground reservoirs at reservoir conditions.

Nonhydrocarbon Gases: Typical nonhydrocarbon gases that may be present in reservoir natural gas are carbon dioxide, helium, hydrogen sulfide, and nitrogen.

Onsystem Sales: Sales to customers where the delivery point is a point on, or directly interconnected with, a transportation, storage, and/or distribution system operated by the reporting company.

Pipeline Fuel: Gas consumed in the operation of pipelines, primarily in compressors.

Repressuring: The injection of gas into oil or gas formations to effect greater ultimate recovery.

Residential Consumption: Gas used in private dwellings, including apartments, for heating, cooking, water heating, and other household uses.

Storage Additions: The volume of gas injected or otherwise added to underground natural gas or liquefied natural gas storage during the applicable reporting period.

Storage Withdrawals: Total volume of gas withdrawn from underground storage or liquefied natural gas storage during the applicable reporting period.

Supplemental Gaseous Fuels Supplies: Synthetic natural gas, propane-air, refinery gas, biomass gas, air injected for stabilization of heating content, and manufactured gas commingled and distributed with natural gas.

Synthetic Natural Gas (SNG): A manufactured product chemically similar in most respects to natural gas, that results from the conversion or reforming of petroleum hydrocarbons and may easily be substituted for or interchanged with pipeline quality natural gas.

Therm: One-hundred thousand British thermal units.

Underground Gas Storage Reservoir Capacity: Interstate company reservoir capacities are those certificated by FERC. Independent producer and intrastate company reservoir capacities are reported as developed capacity.

Vented Gas: Gas released into the air on the base site or at processing plants.

Wellhead Price: Represents the wellhead sales price, including charges for natural gas plant liquids subsequently removed from the gas, gathering and compression charges, and State production, severance, and/or similar charges.

Working (Top Storage) Gas: The volume of gas in an underground storage reservoir above the designed level of the base. It may or may not be completely withdrawn during any particular withdrawal season. Conditions permitting, the total working capacity could be used more than once during any season.